



December 2007

# W960

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*The ultimate entertainment tool*



Sony Ericsson

# Preface

## Purpose of this document

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This White paper will be published in several revisions as the phone is developed. Therefore, some of the headings and tables in this document contain limited information. Additional information and facts will be forthcoming in later revisions.

The aim of this White paper is to give the reader an understanding of the main functions and features of this phone.

People who can benefit from this document include:

- Operators
- Service providers
- Software developers
- Support engineers
- Application developers
- Retailers
- IT decision makers

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# Sony Ericsson Developer World

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On [www.sonyericsson.com/developer](http://www.sonyericsson.com/developer), developers will find documentation and tools such as phone White papers, Developer Guidelines for different technologies, SDKs and relevant APIs. The Web site also contains discussion forums monitored by the Sony Ericsson Developer Support team, an extensive Knowledge Base, Tips & Tricks, example code and news.

In addition, Sony Ericsson offers technical support services to professional developers. For more information about these professional services, visit the Sony Ericsson Developer World Web site.

## Document history

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### Change history

2007-12-04	Version R5A	Miscellaneous updates
2007-10-12	Version R4A	Bluetooth™ headset HBH-DS220 removed from consumer package. Entertainment section updated: “Nightclub Empire” removed and “Vijay Singh 3D Pro Golf” added.
2007-08-23	Version R3A	Miscellaneous updates
2007-07-27	Version R2A	Miscellaneous updates and editorial changes
2007-06-14	Version R1A	First released version

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# Product overview

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W960 is the ultimate entertainment tool. First of all W960 is to be seen as a Walkman® phone and second as a working tool. The 8 GB built-in solid state memory, the large touch-n-play screen and the dedicated music keys support the music experience and positions W960 as the top of the line Walkman® phone. W960 thus continues the W950 track of a slim phone with an extremely good feature set.

A 3.2 megapixel camera, VGA camera for video telephony and video recording/playback are included. The video playback quality is equal to TV quality (20 fps). Using picture blogging, email or MMS messaging the users can easily share their photos and videos.

W960's WLAN capability, as an alternative to a 3G connection, makes surfing the Web on the go a fast and satisfying experience in hotspots. Podcasting is supported and with the full HTML browser, including RSS feeds, browsing the Internet is fast and easy.

For PC synchronization or for the transferring of files between the phone and a computer, a USB cable is provided in the kit. W960 also supports USB high-speed mode, allowing transfer of gigabytes of data in only minutes.

W960 is designed for Symbian's open OS, which enables the users to personalize the content of their phones by downloading and installing new applications through the Symbian application shop.

With W960 Sony Ericsson evolves the Walkman® phone category further into the dedicated music territory, thereby competing not only with other smartphones but also with true music machines.

# Key features

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## 2.6-inch transfective colour touchscreen

The large 2.6-inch (240 x 320 pixels) full graphic QVGA 262k touch-sensitive colour screen enhances viewing and navigation, facilitating high-quality multimedia and entertainment. A transfective screen is significantly easier to use when in direct sunlight.

## Walkman® player

The Walkman® player converts the phone to a portable eAAC+, AAC+, AAC, MP3 and WMA player. Dedicated hardware keys and a rich graphical interface that supports album arts and lets the user pick an album with the tap on the screen, makes W960 a state of the art portable music machine.

## Stereo Portable Handsfree

W960 is delivered with a stereo portable handsfree, HPM-70. The comfortable, small and easy to bring-along HPM-70 has a 3.5 mm plug connector which lets the user easily switch headphones, and use, for example, one type when on the go and another type when at home.

## 8 GB Media memory

W960 has a built-in 8 GB solid state flash memory that can hold up to 8000 songs in eAAC+ format, equal to 700 CDs, or around 2000 songs in MP3 format. The Media memory is accessible from a PC using USB 2.0 High-speed. This permits a transfer of files at 480 Mbps, meaning that 1 gigabyte of data can be transferred in only around 3 minutes!

## Opera™ 8.0 Web browser

Opera™ 8.0 allows full HTML browsing and supports all de facto standards. It features normal or small screen rendering as well as full screen view.

## FM Radio with RDS

The FM radio with RDS (radio data system) offers instant and easy access to FM radio channels. RDS information which is sent out by the currently tuned-in radio station, is displayed directly on the screen. The users just plug in the handsfree (works as an antenna) and can start listening to their favourite stations. The radio can also be started by the alarm clock.

## Music recognition

A music clip is recorded from the FM radio or Sound recorder, and sent to the TrackID™ Internet service. Song title, artist and album name, if available, is sent back to the user.

## Front and rear cameras

A 3.2 megapixel camera, VGA camera for video telephony and video recording/playback are included. The video playback quality is equal to TV quality, that is, 20 fps (frames per second). Using picture blogging, email or MMS messaging users can share their photos and videos with others.

## Gaming

Gaming is a very popular feature in mobile phones, and with Advanced Java, users can add new games and skill levels to further enhance the entertainment value of the phone. There are embedded games included in the phone at purchase.

### **UIQ 3.0 / Symbian 9.1 operating system**

UIQ 3.0 is a media-rich, flexible and customizable software platform, pre-integrated and tested with Symbian OS v9. The Symbian OS makes it possible to add useful applications to the phone including navigation, travel and organizer enhancements.

### **JAVA™**

Download extra content with Java™, for example, new information and entertainment-based applications. This gives users a chance to personalize the functions and features in their phones. Developers get the opportunity to create new applications.

### **PlayNow™ 3.0**

PlayNow™ is a direct-link download application. PlayNow™ users can connect to a live list of top music hits, videos, games and pictures. Content can be previewed before purchasing.

### **Video player**

The Video player supports MPEG4, 3GPP™, RealMedia and Windows Media Video 9. It is possible to play locally stored video clips as well as streaming content from the Internet.

### **Sony Ericsson Media Manager**

Media Manager is music, photo and video clip management software, available on the CD which is included in the kit. Media Manager is used to transfer music, videos, and photos to and from the phone. Users can prepare files for transfer even when the phone is not connected to any computer. They can search for and select music on their computers or audio CDs and convert existing audio tracks to formats that are suitable for mobile use before transferring them to their phones. They can also subscribe to feeds, such as video and music podcasts.

### **Wireless LAN, WLAN**

The W960 WLAN functionality may be used as an alternative to any other type of network connection, such as, a GSM, UMTS, or Bluetooth™ connection, and it may be chosen as the preferred connection method for any of the W960 data applications. The W960 WLAN functionality is compliant with the IEEE 802.11b standard (11 Mbit/s).

### **Bluetooth™ wireless technology**

Several devices can be connected to W960 using Bluetooth wireless technology up to 10 metres away (simultaneous Bluetooth™ connections). For example, the phone can be answered with a Bluetooth headset when it rings and images can be beamed to another phone at the same time. Several mobile phones can take part in a Bluetooth-supported game and the phone and a computer can exchange data such as images, video clips, business e-cards, music files and calendar data. The W960 also supports real time transferring of stereo audio to, for example, a stereo Bluetooth headset.

### **Personal Information Management (PIM)**

A user can stay up-to-date with everyday events by synchronizing phone contacts, calendar appointments and tasks in the phone with the corresponding data in a computer. The USB cable (which comes with the phone) and the built-in Bluetooth feature can be used together with the synchronization software available on the supplied CD. The latest software version may be downloaded from [www.sonyericsson.com/support](http://www.sonyericsson.com/support).

### **Push email**

The push email clients for the major operator solutions are supported in W960.



# Controls and operation



## Walkman®

A press on the dedicated Walkman® button immediately opens the Walkman® player in play view. Navigation is easy and instinctive. When the Walkman® player is launched, three symbols light up at the bottom of the screen. By pressing these symbols the user can play and stop the music or video, go back to the previous track, or jump to the next track. The volume buttons are located on the side of the phone, which makes it easy to adjust the volume of the Walkman® player with the phone still in a pocket.

The combination of the large touch-sensitive screen and a graphically rich interface, that includes album arts, makes browsing the music collection intuitive.

## Standby view

Once the phone is started the Standby view automatically appears on the screen.

The Standby view acts as the starting point for performing a variety of tasks and for accessing applications via the Main menu.

The Standby view is highly customizable, just about every aspect of its appearance, content, navigation methods and behaviour can be changed.

## Touchscreen

W960 offers a large 262 k colour touchscreen, supporting landscape view for imaging and browsing.

To navigate menus and select items the user taps the screen using a fingertip or the stylus.

## Text input methods

W960 offers three text input methods:

- The numeric keypad below the screen. This provides keypad-based prediction and multitap input. Keypad prediction allows words to be entered by a single keypress for each letter (as opposed to the multiple keypress).
- The on-screen keyboard located at the top of the screen, when available.
- Directly-on-the-screen writing, using the stylus.

Text options supported:

- Auto-capitalization
- Word completion
- Next word prediction
- Spelling suggestions
- Dual language prediction dictionaries for bi-lingual users

## Enhanced text prediction

For the input methods of the on-screen keyboard and handwriting recognition, enhanced text prediction can be used. The primary word or next word prediction suggestion is presented, with additional suggestions in a pre-edit box at the top of the screen. If a word is misspelled, the pre-edit box may also suggest closely matching words in the selected language dictionaries, words that have been typed previously, or items that have been stored in the 'My words' personal dictionary.

**Note:** While entering text, the user has the option to either select any of the word suggestions displayed, or to ignore them and continue entering text via the chosen method. If a prediction suggestion is shown when sending/saving the input text, this word will not be sent/saved.

## Push email

Creating, sending and receiving email messages on W960, and inviting people to meetings will be as simple as when it is performed on a home or office computer.

W960 supports full push email and allows for attachments handling. The push email solution Exchange ActiveSync™ is normally pre-installed on W960.

## Flight mode

UMTS, GSM or Bluetooth connection from a mobile phone may be harmful to the safe operation of an aircraft.

Flight mode is a special mode that disables all radio functions, but still allows the user to listen to music, use PIM applications and play games.

In Flight mode it is also possible to use the WLAN (Wireless LAN) function. In such a case it is necessary that Flight mode is enabled before WLAN is, as WLAN by default is disabled in Flight mode.

# Miscellaneous

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## Models

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International version – W960i

- Europe, Middle East, Americas, Latin Asia
  - Latin characters (a, b, c...) keyboard and numeric keypad
  - Latin characters handwriting recognition
  - Cyrillic keyboard version
  - Arabic keyboard version
  - Chinese Bopomofo
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## Accessories

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W960 supports a large range of accessories. See “Accessories” on page 52.

## Manuals

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A User guide and a Web guide for W960 will be available at [www.sonyericsson.com/support](http://www.sonyericsson.com/support). The Web guide offers more in-depth information on W960 functionality.

## Languages

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The languages for W960 will be available on the Internet for download at [www.sonyericsson.com/support](http://www.sonyericsson.com/support).

# Images

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# Product comparison

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Sony Ericsson W960 and W950 have important differences in both hardware and software.

W950 is most of all a Walkman® phone. As a sleek mobile phone with a serious music player this phone addresses the music-loving professionals and selective pioneers.

W960 should also be regarded as a Walkman phone, but with an even more impressive memory – 8 GB instead of 4 GB. With its 3.2 MP camera for quality images and WLAN access for fast content updates it further enhances the experience for its users. W960 will thus attract new user groups.

# Overview

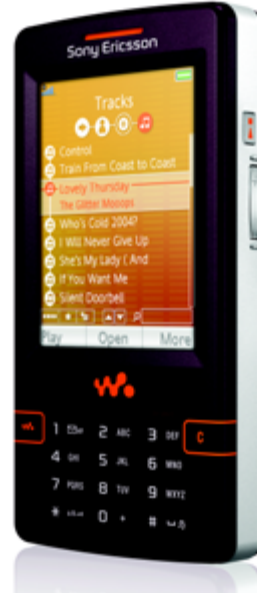
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## W960:



- Is a Walkman® phone built on the UIQ platform 3.0 and Symbian 9.1.
- Incorporates a Walkman® player with album arts and graphic equalizer – providing a dedicated music user interface.
- Is targeted at serious music listeners that require the most powerful music player. Also the versatility of W960 (mobile phone, music machine, camera, PDA) is appreciated.
- Supports podcasting.
- Comes with a 8 GB built-in flash memory (holds up to 8000 songs).
- Has a built-in FM radio with RDS support.
- Offers a 3.2 megapixel camera with auto focus, and a VGA camera for video telephony on the front.
- Has extended services, such as music recognition from the FM radio or Sound recorder. The user can obtain title, artist and album information about unknown songs.
- Supports USB 2.0 high-speed for fast transfer from PC.
- Supports OMA DRM phase 1.
- Supports streaming stereo audio over a Bluetooth connection.
- Comes with a stereo Bluetooth™ headset, a stereo portable handsfree, and music management software (Media Manager PC program).

## W950:



- Is a Walkman® phone built on the UIQ platform 3.0 and Symbian 9.1.
- Incorporates a Walkman® player with album arts and graphic equalizer – providing a dedicated music user interface.
- Is targeted at music-loving selective pioneers.
- Comes with a 4 GB built-in flash memory (holds up to 4000 songs).
- Has a built-in FM radio with RDS support.
- Has extended services, such as music recognition from the FM radio or Sound recorder. The user can obtain title, artist and album information about unknown songs.
- Supports USB 2.0 high-speed for fast transfer from PC.
- Supports OMA DRM phase 1.
- Supports streaming stereo audio over a Bluetooth connection.
- Comes with a stereo headset with remote control, and music management Disc2Phone software.

# Comparison table

	W960	W950
<b>Hardware</b>		
Size (mm) and weight	109 x 55 x 16, 119g	106 x 54 x 15, 112g
Colour	Vinyl Black	Mystic Purple
System	Dual mode UMTS 2100-GSM 900/1800/1900	Dual mode UMTS 2100-GSM 900/1800/1900
Battery	BST-33	BST-33
Talk time	GSM up to 9 hours UMTS up to 3 hours	GSM up to 7.5 hours UMTS up to 2.5 hours
Stand-by time	GSM up to 370 hours UMTS up to 300 hours	GSM up to 340 hours UMTS up to 250 hours
Music listening time	Up to 25 hours	27 hours
Video call time	Up to 2 hours	-
Operating system	Symbian™ OS V9.1	Symbian™ OS V9.1
MMI	UIQ 3.0	UIQ 3.0
Display	2.6" 320 x 240 pixels QVGA, 262 k colour TFT touchscreen	2.6" 320 x 240 pixels QVGA, 262 k colour TFT touchscreen
Transflective screen	Yes	No
Jog Dial	3-way	3-way
RAM memory	128 MB	64 MB
Flash memory (total)	256 MB	128 MB
Application CPU	ARM9	ARM9
User memory internal	160 MB + 8 GB	60 MB + 4 GB
User memory external	No	No
Keylock key	No	No
Back key	Yes	Yes
Play key	Yes	Yes
Keyboard backlight	Yes	Yes
Camera	Yes, 3.2 MP AF	No
Video camera	Yes, VGA	No
Connectivity	USB 2.0 high-speed (up to 480 Mbps) USB mass storage support USB charging support - Bluetooth 2.0 WLAN	USB 2.0 high-speed (up to 480 Mbps) USB mass storage support USB charging support IrDA Bluetooth 2.0 -
<b>Software</b>		
Music	Walkman® player.	Walkman® player.

FM Radio	Yes	Yes
Podcasting support	Yes	No
Browser	Opera™ 8.0 browser that supports frames and JavaScript technology.	Opera™ 8.0 browser that supports frames and JavaScript technology.
Symbian	9.1	9.1
UIQ	3.0	3.0
Multitasking	Yes	Yes
Audio formats	MP3, AAC, AAC+, eAAC+, AU, iMelody, AMR, RMF, DLS, Real Audio, G-MIDI level 1 with 40 voices polyphony, WAV, XMF and WMA (Windows® Media Audio).	MP3, AAC, AAC+, eAAC+, AU, iMelody, AMR, RMF, DLS, Real Audio, G-MIDI level 1 with 40 voices polyphony, WAV, XMF and WMA (Windows® Media Audio).
Video formats	MP4 (MPEG4 and AAC-LC), 3GP (H.263 AMR NB and AAC), Real Audio Video and WMV 9 (Windows® Media Video).	MP4 (MPEG4 and AAC-LC), 3GP (H.263 AMR NB and AAC), Real Audio Video and WMV 9 (Windows® Media Video).
Image editor	Yes	Yes



# Technologies in detail

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This chapter offers a detailed description of the technologies available in W960.

# Multimedia

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## Walkman® player

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The keypad and dedicated hardware buttons are used to start and stop playback, switch tracks and adjust volume.

Songs may be collected in numerous ways, including Internet download and file transfer from PC.

The phone comes with the Media Manager PC program that supports the extracting of songs from CDs, compression and transfer to the phone. Thanks to the USB high-speed support, the transferring goes extremely quick. One gigabyte of data can be transferred in about three minutes.

Music can be further organized on the W960. Music is grouped by Album, with album art being displayed on the screen, by Artist or arranged in user-created playlists.

The user can rate songs or assign moods to them. Based on these ratings and moods, automatic playlists can be generated, and different visual effects can be used to visualize moods.

The player also automatically generates playlists based on, for example, the most or least played songs.

The Walkman® player features an equalizer with predefined settings like Mega Bass™, Pop and Classical.

The Walkman® player is intelligently aware of other applications in W960. Playback is automatically paused when a telephone call is made or received.

## FM Radio

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The FM radio works on the 87.5 to 108.0 MHz frequency band.

A handsfree headset or an accessory with an FM-radio antenna must be attached to the phone for the FM-radio to work.

The FM radio with RDS offers instant and easy access to FM radio channels. The RDS function displays radio text information directly on the screen. This information is sent out by the radio station the user is currently tuned in to. The stereo handsfree or the phone's loudspeaker can be used to listen to the radio.

Using the FM radio it is possible to do the following:

- Record a short section of a song and use the TrackID™ Internet service to automatically identify it.

- Select the FM radio as the alarm signal, thereby allowing W960 to work as a clock radio.
- Display frequency, station name, RDS, radio text and signal strength if the information is available.
- Search station automatically or manually.
- Enter required frequency manually.
- Save a station and customize its saved name.
- Automatically switch to stations when they are broadcasting news or traffic announcements.
- Mute the radio.
- Listen to the FM radio in the background while using another of the phone's applications.

## Music recognition – TrackID™

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Function that enables the user to record a few seconds of a song, send it to a music recognition service on the Internet and have information about

the song – title, artist and album information – sent to the user's phone. TrackID™ is not available in all countries.

## Video player

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The Video player allows users to view and manage video clips that are stored both remotely and locally. The Video player supports the common features that are available in PC video players (play, stop, reposition within the clip, next and previous media file), in addition to play back options such as default view option, repeat current clip and repeat all clips.

Video clips are played back with 30 fps (frames per second), giving TV-like quality. It is possible to set bookmarks, so that watching can be resumed at a certain point in the movie later on.

### Streaming

The video player plays streaming content from the Internet using RTSP (Real Time Streaming Protocol) session control according to the 3GPP™ specification.

## PlayNow™

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PlayNow™ 3.0 is a unique direct-link quality music download application. PlayNow™ users can connect to a live list of top music hits, videos, games and pictures. Content can be previewed before purchasing.

The content available from PlayNow™ differs from country to country. Games cannot be previewed and are only available in certain phone modes.

## Phone applications

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The following call features have been included in W960:

- Ongoing call menu: W960 has a dynamic ongoing call menu that changes to help the user perform actions quickly and simply.
- Accept calls: users can specify which calls to accept and which calls to reject.
- Rich call functionality: W960 allows SMS and MMS messages, as well as contact cards to be easily sent during a call.
- Call notes: W960 can launch Notes during a call. The note is automatically named with the other party's number, name (if known), time of call and date. The user can start writing in the note immediately.
- Follow up call: W960 can automatically create follow up call tasks. The task contains the phone number, contact name, time of call, and date of call.
- Speakerphone.

## Video call

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With the speed of UMTS and video call functionality, W960 can be used to share news face-to-face with business colleagues, family or friends. During a video call, the stream can be switched from the front VGA camera to the back megapixel camera. Use the megapixel camera to share images, such as scenery, with the video call recipient.

One of the camera feeds can be swapped to show a stored picture, allowing the callers reaction to be seen.

The camera can be set up to automatically switch on when a call is received.

The VGA camera is mounted in portrait mode. Landscape video call images are produced from the portrait image feed by clipping the top and bottom of the portrait image. This affects the resolution of the VGA camera and causes a zooming effect.

In video call mode there is no support for Bluetooth headsets.

## Business telephony

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Corporations have traditionally used fixed-line and DECT phones in the office, but now there is a strong trend towards the use of mobile phones to access business telephony features. Of prime importance, however, is that users can still access the features and functionality of their corporate communication system, no matter which phone they are using. W960 can interact with the following corporate systems:

- A corporate PABX (Private Automatic Branch Exchange) switch, equipped with a mobile extension port (like the Ericsson MD110 and BusinessPhone).
- The mobile centrex service, if provided by the operator.
- A telephony server located at the operator's or customer's premises.

### Feature buttons

The user activates corporate features by selecting commands from a list, which can be dynamically sent by the server via an IP link, or pre-configured by the company's IT manager, the operator or a service provider. Each command displays a text description of the function.

When a command is selected, pre-configured DTMF tones are used to communicate the desired function to the server. The phone can even be used to send data that the user is prompted to provide, such as the date they will be back from a business

trip. Feature commands and text descriptions have to be programmed using XML and then imported into the phone.

Ongoing call features are reached from the active call view.

Offline commands and corporate telephony settings can be accessed by pressing the 'corporate telephony' icon once a calling card has been set up. Activating a command will result in an IP packet being sent to the server.

### Routing of corporate calls

If a company uses a PABX switch, calls must be routed via the PABX to gain access to corporate features and resources. W960 can route outgoing calls to the corporate switch, instead of to the dialled B-party. To complete a call, the B-number is then sent to the mobile extension port of the PABX and the call set-up is completed. This process is completely transparent to the user.

A user may dial either an internal number, such as, 1234, or a public number, like +468 123 4567. W960 can be set to bypass the switch for certain types of calls.

## Configuring the phone for the company

The person responsible for the corporate communication services defines how the phone shall be configured. This may be the company's IT manager, the operator or a service provider. They define what feature commands shall be displayed in the phone, how these commands interact with the PABX switch and what text is displayed. They also define how W960 shall handle calls to and from the corporate switch. This is all done in an

XML-structured configuration file, with the extension .pbx. Once created, this configuration file can be easily installed onto the W960.

To ensure that only authorized personnel have access to the PABX, approved mobile phone numbers are added to the list of mobile extensions in the PBX, and only these numbers will be able to use the facilities available.

For more information, see [www.sonyericsson.com/professionalsolutions](http://www.sonyericsson.com/professionalsolutions). Look for "Areas of use".

# PIM applications

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## Contacts

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The Contacts application in W960 holds the details of all the user's contacts. It is fully integrated with the phone and other PIM applications. Each contact can contain multiple phone numbers and email addresses, names, addresses, birthday details, anniversary details, personal notes and a picture or photo. Most of this information will typically be transferred to W960 when it is synchronized with a PC application such as Microsoft® Outlook® or Lotus Notes®. Contact data can also be added and edited on W960. Local and remote synchronization is possible using the SyncML standard. For more information, see "Synchronization" on page 39.

Data can be beamed to and from W960 using Bluetooth wireless technology. It can also be sent and received using Messaging. For more information, see "Object exchange – 'Send as'" on page 23.

Contacts are displayed in a list, which may be filtered by folder, such as 'business' or 'personal'. To see a contact's details select the contact. Tap the icons alongside the contact's details to launch a phone call, a new message or a URL in the browser.

Calls received from new numbers can automatically cause the user to be prompted to save the number.

Contact details can be added to a distribution list. Distribution lists can be used to send groups of contacts the same email, SMS, EMS or MMS message.

## Calendar

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The Calendar application keeps track of appointments and events and enables reminder alarms to be set. The calendar view has been

enhanced to display the selected day's events on the screen.

Calendar entries are displayed in local time, but all appointments and reminders are saved in UTC (Coordinated Universal Time). If the user moves to a different time zone the calendar updates the appointments and reminders automatically. Meeting requests can be sent from the Calendar application via email. Meeting invitations can be received by email and added to the Calendar.

The alarm signal can be personalized using sound clips. Appointments can be shared using Bluetooth wireless technology, and also through messaging. Local and remote synchronization are both supported using SyncML. For more information, see “Synchronization” on page 39. The Chinese models support the lunar calendar.

## Tasks

---

Tasks is a simple yet powerful application that can be used to make reminder notes. Task items may be beamed, exchanged using Messaging, and

synchronized (locally and remotely) using SyncML. For more information, see “Synchronization” on page 39.

## Notes

---

Notes provides a quick means of making notes in either text or sketch format. Notes can be launched during a call.

The note is automatically named with the other party's number, name (if known), time of call and date.

## Time and alarm clock

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Time is a sophisticated alarm clock, which can show the time both locally and in another time zone. If the user swaps the local time zone to the other specified time zone the local time zone is

automatically displayed in the second time zone area. Alarms can be set, and the alarm signal can be any supported sound that is stored on the phone.

## Sound recorder

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Sound recorder is a simple screen-driven dictation machine with the added advantage that recordings can be beamed and exchanged via Messaging. Using the Sound recorder, a user can also:

- Record a personal ringtone.
- Use the TrackID™ service: A music clip is recorded and sent to the TrackID™ service, which returns the song title, artist and album name, if available. TrackID™ is a free service.
- Make changes to existing recordings.
- Rename recordings.
- Delete recordings.

## Calculator

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The Calculator has the features of a standard desk calculator, and is always available from the application launcher.

## Timer

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The Timer can be used to remind the user within a certain amount of time. The application is hidden until the time has passed. A message is displayed and a sound is played exactly when the time has passed.

## Stopwatch

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The Stopwatch can be instantly started and stopped to measure an exact duration of time. The Stopwatch continues to run when a call is answered. The Stopwatch can run in the

background if the application is closed. An icon is displayed in the status bar to show that it is running. Up to nine events can be timed and recorded.

## Converter

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The Converter helps converting the following measurements: distances, volumes, weights, temperatures, speeds, areas and currencies.

## Speed dial

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From Speed dial a user can launch the following features:

- A call
- An entry in Contacts

## Object exchange – 'Send as'

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W960 makes it easy to transfer objects via a Bluetooth connection, or via Messaging. This is presented to the user via 'Send as' commands in applications. The user simply selects an item, such as a contact, then selects 'Send as' and chooses

the method to be used for the sending. To beam an appointment to other people, or to receive a new background image from someone are a few examples.

<b>Bearer &gt; Application (Data Type)</b>	<b>Bluetooth</b>	<b>SMS</b>	<b>MMS</b>	<b>Email</b>
Contact (vCard)	OK	OK	OK	OK
Appointment (vCall)	OK	OK	OK	OK
Task (vCall)	OK	OK	OK	OK
Note	OK	OK	OK	OK
Image	OK	–	OK	OK
Sound Clip (Ringtone)	OK	–	OK	OK
Bookmark	OK	OK	OK	OK
Sound recorder (Voice note)	OK	–	OK	OK
Third Party Application (‘Send as’ API)	OK	–	OK	OK

- To perform a 'Send as' beam operation using a WLAN connection, the receiver must be WLAN enabled and be able to connect to W960.
- To beam an item over a Bluetooth connection, scanning is used to find other devices within range. The user then selects the required device and sends the information across.
- When sending an item using an SMS, EMS or MMS message, or an email, the required message type is created with the selected object attached. It is then sent over the air (OTA).

# Messaging

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## Email

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W960 supports the following standards:

POP3	Used to retrieve and delete messages from an incoming mail server in the network.
IMAP4	Also used to copy, retrieve, move and delete messages from an incoming mail server. IMAP has more features than POP, such as remote folders. IMAP4 also offers support for the IDLE command, which (if supported by the server) offers push capabilities.
SMTP	Used to send messages from a mail client to a mail server.
MIME	A format that describes data, such as defining the attachments included in an email.

Most of the standards above are supported by Internet Service Providers and many corporate environments. W960 is supplied with an Internet

wizard which helps users to configure an account. OTA (Over The Air) configuration of email and ISP accounts is supported.



W960 supports SSL and TLS encryption.

Automatic polling can be used so that email is automatically collected and presented in the Inbox. Controls are provided to filter messages based on size, enabling cost and download time to be managed.

Another option enables only email headers to be presented in the Inbox. Headers are quick to download. The user may read and select headers and request the message to be downloaded if necessary.

If IMAP4 is used, the IDLE command can be enabled to keep the phone connected to the email server. This allows the server to push new messages directly to the W960 as they arrive.

Email transmission is performed in the background, making it possible to perform other messaging functions during transmission.

A list of recently used addresses is available when creating a message. W960 allows distribution lists to be created and sender ID information is sent with message alerts.

W960 can send any type of attachment, including the following:

- Pictures
- Video clips

- Audio files
- SIS files
- JAR/JAD files
- Themes
- vObjects (vCalendar, vCard, vNote, vBookmark)

A signature may be set up so that essential details are automatically copied to the end of each outgoing email.

The supplied Sony Ericsson PC Suite for Smartphones enables email to be synchronized with Microsoft Outlook and Lotus Notes. During synchronization, new email from the PC is transferred in to the corresponding 'synchronized email account' Inbox on W960. Messages and replies written using this account on W960 are transferred and sent via the PC.

Web-based email messages can, of course, be accessed using the W960 browser.

## Email folders

Messaging accounts have the following folders: Inbox, Outbox, SIM, Draft and Sent. Additional folders can be created, see below.

## Local folders

To improve the organization of folders more folders can be created locally on W960. Local folders are only visible in the Messaging application.

# Push email

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Push email is a method of 'pushing' or forwarding email to mobile devices as soon as a message reaches the email server. These solutions may also include calendar and contacts synchronization.

Push email solutions allow email messages to be delivered in the background in the same way as SMS or MMS messages. W960 is prepared for these solutions with Exchange ActiveSync pre-installed. A rich set of other third party applications are available.

**Note:** Push email applications are generally quite power-consuming. Phone performance may be improved by changing from 3G to 2G.

## Push methods

The various solutions use different methods to push messages, usually IP push, by listening to dedicated ports when a session is active. This is similar to instant messaging solutions. Some solutions may also use SMS messages with triggers to the application to start a sync/download, sometimes referred to as pseudo-push.

## Security

All solutions use end-to-end security using SSL, 3DES or AES encryption. Most solutions are based on the use of a fixed password for push email. Initially key exchange is also done by using device

parameters such as the IMEI number. A few solutions combine push with one-time passwords that are limited for a certain amount of time before being re-entered. Many solutions have functionality for enforcing screen passwords. There is also sometimes theft and loss protection through wipe-out commands and lock-out.

## Exchange ActiveSync™

The push email application Exchange ActiveSync™ is normally pre-installed in the phone and ready for setup.

With Exchange ActiveSync™ corporate email, calendar items and contacts on a Microsoft™ Exchange Server 2003 or 2007 can be wirelessly synchronized with the corresponding information in the phone. When on the move, the user can easily, for example, look up details in the company global address book or accept a request for a meeting.

All changes in the phone are automatically synchronized with the user's Exchange Server data. Similarly, all changes to the Exchange Server data are transferred to the phone. With the Direct Push feature activated, synchronization is immediate. If the user, for example, receives a new email in Outlook™ (or a similar client) it is instantly copied to the phone.

## Unified mailbox

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SMS, EMS, MMS, Local Information, beamed and auto configuration messages are all stored within one unified Inbox in Messaging.

- SMS (Short Message Service) – A user can send messages containing up to 160 characters to and from GSM mobile stations (up to 70 characters using unicode text). W960 also supports concatenated SMS messages, that is, a user can write a longer message and W960 will automatically send it using as many SMS messages that are needed. The user can reply to an SMS message with an MMS message and send a fax using the SMS message as the bearer. There is enhanced support for delivery reports and short message class support.
- EMS (Enhanced Messaging Service) – Adds powerful functionality to the well-known SMS standard. An EMS message may include

sounds and melodies, pictures and animations and formatted text. Also EMS messages can be sent as concatenated messages.

- MMS (Multimedia Messaging Service) – MMS messages may include combinations of video clips, animations, pictures, sounds and text. The following tasks can be performed using this service: smart uploads and downloads, automatic transmission when leaving Flight mode, video recording directly from the MMS application, background transmission, direct link use (customized shortcuts to an operator's Web site to get new templates), and replying to MMS messages with SMS messages.
- Local information, automatic configuration items, and beamed items are all to be found in the Unified inbox.

## Area Information

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Area information is SMS Cell Broadcasting.

An SMS cell broadcast allows information to be sent to all mobile phones in a particular geographical area. Information such as traffic news or local weather reports can be sent to an area covered by a single cell or to the entire network.

Broadcast messages are organised into a number of channels. This allows different types of messages to be broadcasted on different channels. Using the phone, users can choose which broadcast channels to subscribe to. The requested text messages are received, the message either

scrolls across the Standby screen or is placed in the Inbox. The user can choose to save the message to the Inbox or not.

Broadcast subscriptions are controlled from the Area information dialog.

When a user is subscribed to channel 50, and this channel is supported by their network, the ID of the current cell (or group of cells) is displayed below the network operator name in the phone display. This is often the telephone area code or postal code of the current location.

## Quickoffice™

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Quickoffice™ is an application that can be used to view and edit Microsoft Word, Excel, PowerPoint and text documents. It can also be used to create new documents and spread sheets.

Quickoffice™ scans W960 and displays a File manger which lists all compatible files (.xls, .doc, .ppt, and .txt) depending on where they are in the phone (the Phone memory, the Media memory, or email can be searched). The File manager view can be changed to only display files that are compatible with one of the support programs.

From the File manager the user can delete, move or copy documents, create new documents, and open existing ones. The user can also send documents using any of the methods available in the phone (email, MMS, WLAN, or Bluetooth™ connectivity).

### Quickword™

Quickword™ allows the user to view and edit word processing documents saved in standard .doc format on W960. Computer format email attachments can be opened directly in the phone without the need for pre-conversion at a computer. Existing documents may also be edited.

Documents can be transferred to and from W960 using email, MMS, WLAN, or Bluetooth™ connectivity. Quickword™ opens files created with Microsoft Word 97, 2000, XP and 2003 and are saved in Microsoft .doc format.

When a document is opened for editing, a copy of the document is created so that the original file is intact. When saving a file, Quickword™ creates a native Microsoft Word file.

### Key features

- Refined user interface for easier document editing and viewing.
- Multiple Undo and Redo commands including cut, copy, paste and formatting functions.
- View tables embedded within documents and edit the text (tables are displayed in a single column format for easier viewing on W960, actual table format of the document is not affected).
- MS Word compatible paragraph and style formatting.
- Advanced text formatting and full font control including typeface, size, bold, italics, superscripts, subscripts and underline.
- Open, view, edit and create both .doc (MS Word) and .txt (text) files.
- Edit Word documents, and forward to colleagues just as from a desktop computer or laptop.
- ZoomView™ lets the user pick the best display size.
- Quick navigation through documents.
- Colour support and colour picker for changing font colours.
- Keyboard support for folding portable keyboards and on-device text entry.
- Format paragraphs with left, center and right text justification.
- Portrait and landscape mode supported.
- Cut and paste text, undo edits, and more.
- Edit-protect mode – prevents editing or making alterations while reviewing documents.

### Quicksheet™

Quicksheet™ is a full function spreadsheet with Microsoft Excel compatibility. Quicksheet™ opens files created with Microsoft Excel 97, 2000, XP and 2003 and saves them in Microsoft .xls format.

## Key features

- Offers the most frequently used scientific, financial, statistical, date & time, lookup and aggregate Excel functions and sorting.
- Multiple sheets per workbook and sheet linking.
- Advanced cell editing features that allow to you create and modify spreadsheets easily. Permits cell formatting in a number of different ways.
- Quickly sort data and lists.
- Find and Find/Replace functions.
- Cell and font colour formatting.
- Column resizing, row and column freezing.
- Portrait and landscape mode supported.
- Saves changes as a native Excel file that can be sent via a WLAN, USB or Bluetooth connection, or via email.

## Quickpoint™

Quickpoint™ allows you to view and edit Microsoft PowerPoint presentations. The application is compatible with MS Office 97, 2000, XP and 2003. It allows a variety of modes for viewing such as slide, notes and outline views.

## Key features

- Edit slide text in Outline view and show the changes in the Slide View.
- Edit speaking notes.
- Edit PowerPoint presentations and forward them to colleagues just as from a desktop computer or laptop.
- View and edit PowerPoint slides and notes. Advanced viewing includes three views: Outline view, Slide view, and Speaker Notes view.
- Zoom in and out.
- Portrait and landscape mode supported.
- Save changes as a native PowerPoint file that can be sent via a WLAN, USB or Bluetooth connection, or via email.
- Give presentations directly on the W960 with iGo® Pitch Duo™ display accessory or on a remotely controlled computer.
- Send presentations to a TV using the Sony Ericsson Media Viewer MMW-100 or to a Bluetooth enabled PC projector.

## Pdf+

Pdf+ is a viewer for Portable Document Format (or PDF) files. Pdf+ reads and displays standard PDF files, without the need for conversion on a computer to a proprietary format.

## Pdf+ features:

- View the text, line drawings and bit maps in the document.
- Browse the document, and go to a specific page.
- Wrap the text to make it fit the screen.
- Zoom in and out to maximize the amount of text and graphics that can be read on the screen.
- Hide the title and the status pane to maximize the viewing area.
- Search for strings in the text of the document.
- View and follow bookmarks.
- Follow links to other pages in the document.
- Follow URLs.
- Read files protected with a user password.

The 'wrap' view displays the document so that as much text as possible is visible on the screen. Images and line drawings are not visible in this view. Pdf+ can display PDF 1.0, 1.1, 1.2, 1.3, 1.4 and 1.5 files.

Limitations: Pdf+ does not handle the dynamic content of a PDF file, such as hypertext links, and cannot render Type 0 or Type 3 fonts.

## Document types supported

Document type	Features
Adobe PDF	Viewer
Microsoft Excel	Editor
Microsoft PowerPoint	Editor
Microsoft Word	Editor

# Camera

## 3.2 megapixel camera

With the integrated 3.2 megapixel camera, the user can take pictures and video clips and store them in the Phone memory or the Media memory.

The megapixel quality gives excellent results when images are printed or viewed on a computer or TV.

Images can be sent as an attachment in an email or as a picture message (MMS). The picture can also be sent via a WLAN, USB or Bluetooth™ connection.

The still picture resolution can be set to:

- QXGA (2048 x 1536)
- UXGA (1600 x 1200 pixels)
- SXGA (1280 x 960 pixels)
- VGA (640 x 480 pixels)

The image quality settings can be set to:

- Fine (low compression)
- Normal (medium compression)
- Economy (high compression)

All these resolutions provide an 18-bit colour depth (262 k colours).

When using the camera the viewfinder is displayed in landscape orientation. The camera has a photo light which acts as a flash, the flash can be manually enabled when required.

### Auto focus

The camera has auto focus functionality. To operate auto focus the camera button is pressed halfway. The camera focuses on the image, a symbol is displayed in the viewfinder to indicate that the image is in focus. Press the camera button all the way to take the image or release it to change the camera position and re-focus the image. Auto focus can be turned off, and the image is captured immediately when the camera button is pressed.

Macro mode is used for close-ups. The lens focuses on a much shorter distance, 10 - 50 cm.

### Smart zoom

For close-up pictures, the camera has a 3.0 x digital smart zoom, working in 22 steps. When the zoom level is increased, the frame size is reduced – smart zoom.

### Burst mode

When taking a photo of an object that moves quickly, burst mode may be used to take four pictures in rapid succession. Burst mode takes pictures in VGA resolution.

## Using the camera and video

The camera and video can be started with the camera button or from the Main menu. To many of the camera settings there are shortcuts on the keypad, thus eliminating the need for opening the Settings menu and pointing at the screen.

### Recording video clips

When the camera application is running, the user can select video capture mode. Video clip capture quality can be set to:

**High - AAC-LC ('Fine' in phone)**  
(sound = mono 8 kHz @ 12.2 kbps)

Frame size	Frame rate (FPS)	Bandwidth (kbps)
QVGA	15	384
QCIF	30	256
QQVGA	30	192
SQCIF	30	128

**Normal - AAC-LC ('Normal' in phone)**  
(sound = mono 8 kHz @ 12.2 kbps)

Frame size	Frame rate (FPS)	Bandwidth (kbps)
QVGA	10	256
QCIF	15	128
QQVGA	15	96
SQCIF	24	96

**Low - AMR-NB ('Economy' in phone)**  
(sound = mono 8 kHz @ 12.2 kbps)

Frame size	Frame rate (FPS)	Bandwidth (kbps)
QVGA	7.5	192
QCIF	7.5	64
QQVGA	10	64
SQCIF	15	64

### Video format

Video can be stored in the following formats:

- 3GPP for low quality video recordings to be used in MMS messages.
- MPEG-4 for normal and high quality video recordings.

### Auto-exposure control

The camera has a full automatic exposure control that selects the optimal exposure needed to get an excellent picture.

### Lighting adjustment

The camera has built-in compensation for bright skies that automatically adjusts the brightness of landscape pictures. This avoids the dark and dull images that automatic cameras sometimes give in difficult lighting situations. It is especially effective for outdoor photography on grey and cloudy days.

### Photo light

The camera has a high quality LED light to improve picture quality in dark environments.

## Business card scanner

It is possible to take a photo of a business card and then use the Business Card Reader application to scan the card. The scanned text can then be saved as a contact.

The business card scanner is able to handle Latin and Chinese (traditional and simplified) fonts, and can handle business cards in the English, Chinese, German, French, Spanish, Italian, Portuguese and Swedish languages.

## Picture Gallery

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Picture Gallery lets the user send and organize photographs. Picture Gallery supports image types JPEG, BMP, GIF (including animated), MBM, PNG, and WBMP in up to 262 k colours. Picture Editor may also be launched from Picture Gallery.

## Picture Editor

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Using Picture Editor, it is possible to crop, rotate and resize images. The editor also includes fun layers, clip art and tools for drawing on the image using the stylus. Different pen sizes and colours are available, as well as a text tool for formatting and inserting text into the image. When creating MMS

messages, the Picture Editor is used for editing inserted JPEG, PNG, GIF and BMP images as well as for creating simple JPEG image from scratch. A simpler version of Picture Editor is used for creating images for EMS messages.

## Entertainment

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### MusicDJ™

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MusicDJ™ is a MIDI sampler with pre-recorded drum, bass, chord and accent loops in different music styles. The samples are combined to create personal polyphonic ringtones.

## Games

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Gaming on the W960 is greatly improved due to the 3D hardware accelerator.

### Vijay Singh 3D Pro Golf

Vijay Singh 3D Pro Golf simulates the experience of being the unseated golf champion. This game is one of the best games of golf available on a mobile. Vijay Singh 3D Pro Golf looks and plays like the best console golf sims of the 16-bit era.

- Choose from several golfer archetypes, ranging from the power hitter to the short-game wizard.
- Take on Vijay on either nine or 18 holes.
- Choose from three difficulty levels.
- There is a standard swing meter, which uses timed button presses to determine a shot's power and accuracy.
- Aim your shot by rotating your character. The impact this has on your shot's trajectory will simultaneously be shown on a map of the hole.



- Putting uses a familiar meter as well, and it takes place on a wire-frame grid, the purpose is to impress you with the complexity of golf's short game.

In every shot situation, the control feels pretty tight, and there is a distinct difference between clubs. If you want to chip your way out of a bunker, you'd better use a sand wedge. This sort of realism is a must in the simulation category.

Your viewpoint will shift at least twice on every stroke, highlighting different parts of the shot. In this way, Vijay Singh 3D Pro Golf does a better job of approximating the presentation of televised golf than its 3D competitors.

## QuadraPop

QuadraPop is a simple yet addictive Java™ based puzzle game. To make an item disappear, at least four items of the same kind (in connection with each other) are needed. The more items that disappear at the same time, the higher the score. During the game, blocking items may appear, to make it harder for the items to connect. A blocking item will go away only if an item next to it disappears.

# Browser

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W960 features the integrated Opera™ 8 browser. This browser has been designed to display practically all Web pages on the Internet. The browser supports the de facto HTML standard “street HTML” (used by most Web developers), JavaScript™ technology, frames, and the ability to add plug-in applications. This means that users can access their favourite Web pages also from the phone.

Users can quickly and easily switch between portrait and landscape presentation as well as change from a normal view with scroll bars to full screen view. Pen motions are used to slide the page on the screen.

Users can select ‘fit to screen’ to reformat pages to fit inside the screen width and eliminate the need for horizontal scrolling (Small Screen Rendering is supported).

Some key features:

- By tapping and holding on a bookmark the page is displayed in a new window.
- By tapping and holding on a link a context-sensitive menu of alternative actions is displayed: an http link would give the options Open, Open in new window, Open in background and Send as.
- Secure downloads manager – especially useful for downloading commercial media objects that need to be paid for.
- Pages can be saved for offline viewing.
- All private data can be cleared with one command.
- Built-in pop-up blocking.

## Browser security

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W960 supports TLS/SSL to provide a secure encrypted link between the browser and the Web site. This method is commonly used for secure transactions on the Web. An icon in the display

indicates when a secure connection is in use.



## TLS Security

When using certain Internet services such as banking, the user may require a secure connection between the phone and the Web site. W960 is based on the WAP 2.0 specification where security functionality is specified with a technology called WAP TLS Profile (Wireless Application Protocol Transport Layer Security).

The Internet protocols that handle the connection, its transport and its security are structured in protocol layers. The security is handled by the TLS layer operating above the transport protocol layer. There are three TLS classes that define the levels of security for a TLS connection:

- Anonymous TLS involves encryption with no authentication.
- Server authentication involves encryption with server authentication.
- Client authentication involves encryption with both server and client authentication

Server authentication	Requires a server certificate stored at the server side and a trusted certificate stored at the client side.
Client authentication	Requires a client certificate stored at the client side and a trusted certificate stored at the server side.

## Certificates

To use secure connections, the user needs to have certificates saved in the phone. Certificates can be downloaded and installed when required. There are two types of certificates:

Certificate authority	A trusted certificate used to verify that a Web site is genuine. If the phone has a stored trusted certificate of a certain type, it means the user can trust all Web sites which present a certificate that can be verified by the trusted certificate. Certificates are preinstalled in the phone and can be downloaded from the trusted supplier's Web page.
User certificate	A personal certificate that verifies the user's identity. A bank that the user has a contract with may issue this kind of certificate.

W960 is preinstalled with X.509 certificates from Baltimore, Entrust, Geotrust, GlobalSign, GTE Cybertrust, RSA, Sony Ericsson, Thawte and VeriSign.

## RSS feeds

RSS provides a way for Web sites to distribute their content outside of a Web browser. A news Web site might have an RSS feed which contains breaking stories, while a magazine Web site may provide an RSS feed with excerpts of their latest articles.

An RSS feed is a file containing a list of news items, each of which has a title, a description and a URL link to read more on the content provider's Web site.

With the RSS Feeds application the user gets information from the Internet into an easy-to-view format without browsing the Web sites. The user can browse information from dozens – or hundreds – of Web sites without ever visiting them.

With RSS Feeds the user can do the following:

- Subscribe.
- Update feeds manually or via a predefined schedule.
- Organize feeds into folders.
- Read news items.
- Send a news item to another device via email, SMS, MMS, or Bluetooth connectivity.

- Link to more information via the Web browser.

# Connectivity

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## WLAN

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Wireless LAN, WLAN, is a network access technology becoming increasingly common around the world. It allows users with portable computers and wireless devices to access network resources wirelessly, at the office, in the home, or in public spaces (public Access Zones or so-called “hot spots”), such as cafés, airports, aeroplanes and hotels.

W960 WLAN may be used as an alternative to any other type of network connection, such as, a GSM, UMTS, or Bluetooth™ connection, and it may be chosen as the preferred connection method for any of the W960 data applications.

The WLAN functionality is compliant with the IEEE 802.11b standard (11 Mbit/s), and will work simultaneously with W960 GSM, UMTS, or Bluetooth connection interfaces.

The WLAN functionality can be switched on or off as required, including when the W960 is placed into Flight mode.

W960 allows the user to rapidly make a connection to a public hot spot. A WLAN icon is available on the W960 status bar and this icon may be used to open the WLAN set-up screen. The user may then use the WLAN and scan for available networks. A connection to a chosen hot spot may then be made without the need for entering any technical details about the network.

The phone also uses a feature called “Fast connect” to allow the user to simply enter the encryption key or password when trying to make a connection to an unknown access point that uses WPA-PSK, WPA2-PSK or WEP encryption.

It is possible to use WLAN in conjunction with a personal firewall and virus scanner.

For connection to a private network in the office or at home, W960 supports the following encryption/authentication methods:

- WEP
- Shared WEP
- Dynamic WEP
- WPA Personal and WPA2 Personal
- WPA Enterprise and WPA2 Enterprise

As regards the ‘WPA Enterprise and WPA2 Enterprise’ authentication methods, the following network authentication support apply:

- EAP-TTLS
- PEAP with EAP-MS-CHAPv2
- PEAP with EAP-GTC
- EAP-TLS
- EAP-SIM
- EAP-AKA

Setting up more complex settings for infrastructure and ad-hoc modes is simplified by the use of a wizard that presents relevant options after each selection is made. For example, a WEP key selection screen follows the selection of shared encryption.

Virtual private networks software is supplied for use with WLAN in Infrastructure network mode.

Other W960 WLAN characteristics:

- API for VoIP (VoIP client by 3rd party supplier)
- Advanced power save function
- 20 mW output power
- W960 is Wi-Fi CERTIFIED™

## Voice over IP, VoIP

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W960 comes with enablers for creating a Voice over IP (VoIP) client. This makes it possible to use the phone as a complement to, or even as a replacement for, a fixed phone at home. A Sony Ericsson partner may develop, market and deliver VoIP clients using the audio and network enablers provided in W960. Near-realtime PCM Record & Play, echo cancellation, and access to audio paths are a few examples of enablers.

The Sony Ericsson WLAN implementation makes it possible for a VoIP client to use wideband codecs, WLAN Powersave for increased standby times, and WMM for requesting a high Quality of Service (QoS) level.

If the WLAN signal strength is decreased, the VoIP client has the opportunity to initiate a Circuit-switched call in order to maintain an ongoing call.

## Bluetooth™ wireless technology

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W960 features the built-in Bluetooth™ 2.0 wireless technology. Its Bluetooth power class 2, +4 dBm radio link, operates in the globally available 2.4 GHz radio frequency band, ensuring fast and secure communications up to a range of 10 metres, or more in ideal conditions. Please note that in the few countries where the use of Bluetooth wireless technology is not allowed, the Bluetooth function will be disabled. In countries where only lower output than 4 dBm or 0 dBm is allowed, the output is limited as a customized factory setting.

Bluetooth wireless technology facilitates instant connections, which are maintained even when the devices are not in the line of sight. Enhanced audio quality voice transmission is provided under adverse conditions, making it possible to use a headset connection at all times.

### Using Bluetooth wireless technology in the W960

#### True wireless connection

Connect without cables to headsets, car handsfree equipment, computers/PDAs, digital still and motion video cameras and other devices.

#### Up to 16 added devices

The W960 identifies and maintains up to 16 devices which are displayed in a list.

#### Radio link

No line of sight is required; the phone can remain in a briefcase or in a pocket.

#### Secure and fast

Data connection with a Bluetooth connectivity PC/laptop or PDA turns the phone into a modem for connecting to the Internet and for data transfer (faster than cable).

#### Synchronization

Fast synchronization, even without line of sight, of calendar, notes and phonebook with PC/laptop.

#### Business cards

Quick exchange of business cards, notes and calendar events with other phones and devices.

#### Imaging and music

Exchange still images and video clips with another mobile phone, a PC/laptop, or with a digital still or motion video camera. Use the W960 as a modem to send pictures from a digital camera to an imaging server.

Exchange music files with another mobile phone and a PC/laptop. Play MP3 and MIDI files sent by the phone.

Enable images to be shown on a TV or another display via an accessory, such as the Bluetooth Media Viewer MMW-100.

Transfer stereo audio in real time, to a stereo headset that supports A2DP, Bluetooth audio streaming.

## Audio quality

W960 uses an algorithm that repairs lost audio packets. When needed, a new packet is inserted with content based on previous packets. This, in conjunction with the high sensitive and high output power radio will enhance the audio quality compared to a standard Bluetooth device.

## File sharing

By using the Server role of the File Transfer Profile, the phone enables the use of a computer to manage content files that reside in the phone's file system. Most computer Bluetooth applications provide an explorer-like user interface for the file transfer service. The content in the Games and more folder is not exposed in the file transfer server. Opening one of the folders will show a list of files related to that folder, such as, images in the Pictures folder. Using the computer application the user can now: retrieve files from phone to computer, delete files from the phone and transfer files from the computer to the phone using the normal drag and drop mechanisms provided by the computer.

## File browsing

By using the Client role of the File Transfer Profile, the phone enables the user to access file systems of other devices, that support the Server role of the same profile. After pairing the phone with the other device, the user can connect to the other device by selecting it in the 'My devices' list under the Bluetooth menu and selecting the browse option that should be available on the left selection key. If the browse option does not appear the user can select the Service option to update the phone's knowledge that file browsing is possible with this device. When the phone is connected to the file server, the user can browse the shared folders and retrieve files listed in the folders. The user can transfer files to the file server device using the normal Send/via Bluetooth option.

## Media viewing

The phone can send images and sounds to a media viewer device, such as, the MMW-100 TV adaptor accessory. The user can also conveniently

run a slide show on the TV showing a set of nice phone camera pictures for family and friends. The phone can connect to a Bluetooth device that can receive images, the image can be transferred to the remote screen and displayed.

## Profiles

The following Bluetooth profiles are supported in the W960:

- Dial-up Networking Profile
- Generic Access Profile
- Generic Object Exchange Profile
- Object Push Profile
- Serial Port Profile
- Handsfree Profile
- Headset Profile
- Synchronization Profile
- Basic Imaging Profile
- File Transfer Profile
- Human Interface Device (HID) host only Profile
- Stereo Advanced Audio Distribution Profile
- Advanced Audio/Video Remote Conference Profile

## Remote control

The phone keypad is configured for control of a certain computer application through a special type of HID configuration file consisting of an XML file for the keypad and an image for the display. HID configuration files can be downloaded into the phone using the normal file transfer mechanisms.

Users can even modify the files themselves on their computers. A few configuration files, pre-loaded in the phone, enable the user to navigate on a computer desktop and control presentations and Media players.

## System functions

### Characteristics

The HID configuration files, and the set of predefined HID configuration files, are customizable. The configuration files can be modified by the user if transferred to, and opened on, a computer.

## Used enablers and bearers

The HID based remote control function works over Bluetooth. It is possible to download the HID configuration files via a Bluetooth, IR or USB connection. It is also possible to transfer the files to another device using a Bluetooth connection.

## Power save mode

The phone uses sniff mode on headset, handsfree and HID connections which means reduced power consumption and shorter connection set-up times.

## USB

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W960 is USB 2.0 (Universal Serial Bus) compliant. The idea of the USB is to allow easy connection of a mobile phone to a PC. USB is designed to be “completely Plug and Play”, meaning that devices will be correctly detected and configured automatically as soon as they are attached.

USB in a mobile phone means convenient data transfer between the phone and a PC.

At synchronization of PIM data with the corresponding data in a computer (using the Sony Ericsson PC Suite for Smartphones application) USB full-speed mode, 12 Mbps, is used.

For transferring large amounts of data, the user can select USB 2.0 high-speed – up to 480 Mbps. This greatly reduces the time needed to transfer, for example, a large number of music files.

W960 supports USB charging, however, not in high-speed mode.

## Data storage

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The memory of W960 is divided into:

- A Phone memory with a phone part, and an 'Organizer' part running Symbian OS. The 'Organizer' part consist of a RAM (Random Access Memory) that is controlled by the Symbian OS, and a 256 MB flash memory. The flash memory is split into approximately 96 MB for operating purposes and up to 160 MB for storage of user data, additional languages and settings such as the active theme. This part behaves just like a normal disk drive. The folders can be viewed and managed from the File manager application or from a connected PC.
- An 8 GB flash Media memory for user file storage, primarily intended for music files. This memory behaves like a normal disk drive. It can be accessed as a USB mass storage device from a PC, allowing the fast transfer of files.

Flash memories retain data even with no power applied. Unlike some PDA devices, W960 does not require a small 'memory backup' battery. Data stored on W960 is therefore not subject to loss due to such a battery running down.

## User storage

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The user storage space of the Phone memory (C: drive) and Media memory is shared across applications without any imposed restrictions, apart from the whole space becoming full.

Unlike a PC, the user does not need to be aware of the underlying filing system. Applications will always store information automatically in the appropriate folder, simplifying the management of data. Third party applications may implement more complex file management solutions where required.

W960 supports USB high-speed data transfer at 480 Mbps. In this mode, File transfer mode, the phone is seen as a USB mass storage device from the PC. When connected to a computer in File transfer mode, the Media memory and all files stored on it are inaccessible from within the phone

and its applications. The Media memory is accessible again as soon as the USB cable is disconnected.

When synchronizing PIM applications or making backups using the Sony Ericsson PC Suite for Smartphones application, Phone mode must be used.

### User storage configuration

Applications and information are placed in the Phone memory of W960 in the factory. This provides sample demonstrations, educational, multimedia and fun contents so that W960 can be used directly out of the box. Much of these contents can be deleted by the user in order to make the space available for personal use.

## Action at master reset

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Master reset restores the phone to its purchase state, all user data is deleted. When a master reset is initiated the user can select to keep all user-installed applications. Data can be restored as follows:

If the user has backed up W960 using the Sony Ericsson PC Suite for Smartphones application, then the C: drive can be restored to the condition it was in when the backup was made. The exception is DRM Forward Lock protected files which cannot be transferred to other media and therefore not backed up.

Otherwise, data can be re-loaded from the Sony Ericsson Web site.

Since Multimedia content is easily transferable using Bluetooth wireless technology, it is simple to restore favourite content from someone else's W960 (unless DRM protected).

The 8 GB Media memory is not affected by a master reset.

## Folder view of internal storage

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When viewed from a PC using the Sony Ericsson PC Suite for Smartphones application, the 'C:' drive is named 'Phone memory', but only a subset of the folders is accessible from the PC. The 8 GB flash memory is named "Media memory".

On both the Phone memory and the Media memory, there is a folder for each media type: audio, video and image. Documents are stored in the 'Document' folder. An 'Other' folder provides a place for files that do not fit into the other categories.

A folder is created beneath the applicable media type. There is no limit on the number of subfolders that can be created. Unfiled folders are created in the initial folder structure and all material is placed

in the unfiled folder by default. Sony Ericsson Multimedia Content is stored in 'Sony Ericsson' subfolders.

## Synchronization

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To be truly mobile, users must be able to carry their important information with them. Equipping mobile phones with Personal Information Manager (PIM) programs like calendars, task lists and phonebooks gives users access to their most important data anywhere and anytime. The information is kept updated by synchronizing it with the information at the office or at home. The growing use of

groupware such as Microsoft Outlook means that more and more meetings are booked electronically in daily business life.

W960 uses the SyncML 1.2 protocol for synchronization. This means that it has the compatibility to synchronize with a wide variety of devices over a number of different communications media.

## SyncML – an open standard for synchronization

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### SyncML background

Leading the way in providing remote synchronization capability, Sony Ericsson realizes that interoperability of remote synchronization is of utmost importance if mobile data use is to become as widespread as generally predicted. That is why Ericsson, along with IBM, Lotus, Motorola, Matsushita, Nokia, Palm Inc., Psion and Starfish Software, founded the SyncML initiative in February 2000. Supported by more than 600 software and hardware developers, the SyncML initiative seeks to develop and promote a globally open standard for remote synchronization, called SyncML. Unlike many other synchronization platforms, SyncML is an open industry specification that offers universal interoperability. Because it uses a common language, called XML, for specifying the messages that synchronize devices and applications, SyncML has been called the only truly future-proof platform for enabling reliable and immediate update of data. The benefit for the end user is that SyncML can be used almost anywhere and in a wide variety of devices, regardless of application or operating system.

W960 uses SyncML for both local synchronization (with a PC using Bluetooth™ connectivity or a cable connection) and remote synchronization over HTTP.

### What information can be synchronized in W960?

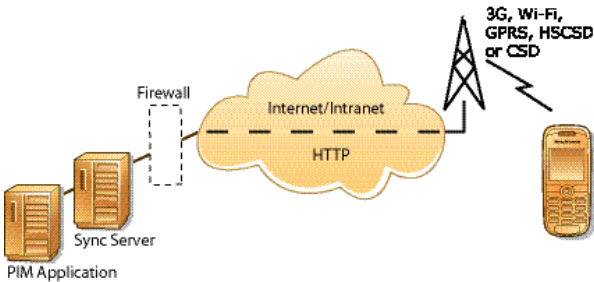
Application	Remote sync	Local sync
Contacts	OK	OK
Calendar	OK	OK
Tasks	OK	OK
Notes (text part only)	**	OK
Email	**	OK
Bookmarks	**	OK

\*\* Notes, Email and Bookmarks implementation are proprietary and therefore not SyncML compliant.



# Remote synchronization

Remote synchronization takes place over the air using HTTP and is the ideal way to keep the W960 up to date. 3G enables a fast connection to the network – the synchronization can be started in seconds.



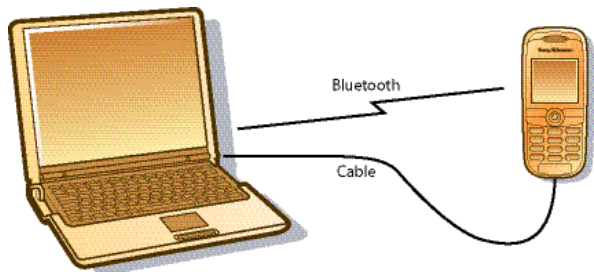
Synchronization services will be offered by third-party service providers and as added capability to corporate PIM applications. Corporate PIM applications such as Microsoft® Exchange can be supplemented with SyncML capability.

## Server alerted synchronization

If updates are made on the PC the server automatically notifies W960. The updates are automatically synchronized to W960. A remote server can initiate a synchronization with the W960 using WAP Push.

# Local synchronization

W960 is supplied with PC software for local synchronization. It may be installed from the supplied CD or downloaded from the Web. For more information on PC Suite, see “Sony Ericsson PC Suite” on page 41.



## Synchronization capacity

W960 meets the standard performance requirement to synchronize the following number of items “within a reasonable time”:

Contacts	2000
Calendar items	1000
Notes	500
Tasks	500
Email messages	1000
Bookmarks	500

## Bluetooth™ wireless technology or cable

W960 always synchronizes using SyncML, regardless the connection type. It connects via Bluetooth™ wireless technology or cable. The cable is connected directly to the phone or via a desktop charger connector.

## Automatic synchronisation

Synchronisation can be configured to start automatically, given that a suitable synchronization program is running on the other device:

- When the USB cable is plugged in to W960.
- When Bluetooth wireless technology is activated on both devices and they come into operating range.

## Intelligent process

A synchronization engine performs the task of synchronizing. For local synchronization, the synchronization engine is an application that runs on the desktop computer. The synchronization



engine compares, updates and resolves conflicts to ensure that the information in the phone is the same as that in the computer.

## Sony Ericsson PC Suite

The Sony Ericsson PC Suite for Smartphones (PC Suite) CD, which is delivered with the phone, includes the following applications:

Synchronization	Application for local synchronisation of PIM data between the phone and PC applications such as Microsoft Outlook and Lotus Notes®. For more information on synchronization, see “Synchronization” on page 39.
File Manager	Enables Windows Explorer to see the phone as a device and the Phone memory and the Media memory as two disk drives on the device. Files can be copied between the PC and the phone, or in the other direction. Typical uses include: <ul style="list-style-type: none"> <li>• Archiving pictures taken on W960 to PC storage.</li> <li>• Moving images to W960 to use in personalization, MMS messages etc.</li> <li>• Storing MP3 files in the W960 Media memory.</li> <li>• Storing work documents (Word, Excel) on W960 to read on the move.</li> </ul>
Mobile Networking Wizard	Wizard and drivers for using the phone as a modem over a Bluetooth connection, or using the USB cable.
Backup Manager	Files in the user data area (which includes installed third party applications) are backed up and stored on a PC. The restore option returns data to the phone, for example, after a software upgrade. Backup Manager requires a USB cable connection.
Download Language	Enables the user to load a different language from the CD and switch the phone user interface to that language. The language files are also available for download from <a href="http://www.sonyericsson.com/support">www.sonyericsson.com/support</a> .
Application Installer	Software for installing new applications in the phone from a PC.
Adobe Photoshop Album SE	Application for storing, editing and sharing images.
Apple QuickTime Player	Application for viewing audio and video files.
Sony Ericsson Update Service	Application for updating the phone with the latest software.

### Compatibility

The PC Suite software enables synchronization with the following Personal Information Managers (PIMs):

- Microsoft® Outlook® 2000, SP3
- Outlook 2002, SP2
- Outlook 2003, SP1
- Outlook 2007
- Lotus Notes® 5.0, 6.0, 7.0
- Internet Explorer 6, 7
- Windows Address Book
- Windows Contacts

The PC Suite software is designed to work with:

- Windows 2000 Professional, SP4
- Windows XP Home, SP2
- Windows XP Professional, SP2
- Windows Vista Business, Enterprise, Home Basic, Home Premium, Ultimate

The general system requirements are as required by the used PC operating system, or as a minimum:

- PC with 500 Mhz or higher processor clock speed
- 256 MB of RAM or more
- 1.5 GB of available free hard disk space
- Super VGA (800 x 600) or higher resolution video adapter and monitor
- Keyboard and Microsoft Mouse or compatible pointing device

Older operating systems, for example, Windows 98, Windows ME and Windows NT will not work together with PC Suite.

It is recommended that the PC Suite software is installed for the same language as the operating system on the PC.

### Mac compatibility

Sony Ericsson PC suite for Smartphones cannot be used on Mac computers. For Mac users, however, it will be possible to use Apple's synchronizing software iSync 2 to synchronize data in the W960 with PIM applications in the computer.

**Limitations:** Only address book and calendar can be synchronized, and the synchronization must be performed over a Bluetooth connection.

### Media Manager

Apart from all the PC Suite applications the CD also contains the Media Manager application, which is software for loading the phone with music files. The users can use Media Manager to search for music on their computers or audio CDs, convert existing music files, and then copy the MP3 files to the phone.

## DRM

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The Digital Rights Management (DRM) technology enables the secure distribution, promotion, and sale of digital media. Examples of such content include screen savers, themes, ringtones, and branded games (currently restricted to java games/midlets only). In other words, content providers can control how users may use different types of content in devices, such as, mobile phones, computers or PDAs. Content providers can also control the use of content in related services, such as MMS and download.

Sony Ericsson is actively focusing on technology standardization for the DRM concept, and supports the ongoing standardization work and activities of the Open Mobile Alliance (OMA). Sony Ericsson is fully committed to open standard solutions in the mobile environment and is a principal driver of many open standard initiatives. This will ensure the

interoperability of mobile phones in the DRM area and also result in a strong, competitive DRM standard.

W960 supports the OMA DRM v1 standard.

### FWL – Forward Lock

W960 supports OMA DRM Forward Lock. It is the simplest OMA use case, with no special licences defined. The content is provided in a single DRM packaged file, thus protecting the content from being distributed by the user. It enables a secure means for the content provider to deliver/provide content which incurs a charge. Forward Lock content will normally be received by W960 as part of an MMS message or via HTTP download. W960 supports OMA Download. More information is available at [www.sonyericsson.com/developer](http://www.sonyericsson.com/developer).

## CD – Combined Delivery

W960 supports OMA DRM Combined Delivery/Forward Lock. Content and associated licences are downloaded or delivered to the user as a single DRM packaged file. This means that the content or licence issuer controls to which extent the content can be used. As with pure Forward Lock, the user will be unable to distribute this content for use on another device.

## SD – Separate Delivery

W960 supports OMA DRM Separate Delivery. Content and associated licences are received as separate DRM packages, either simultaneously or at different points in time. This enables the distribution of content to other users – with the same possibilities to control the use of the content as exist with Combined Delivery/Forward Lock. Distribution of content to other users will require them to obtain licences from the licence issuer.

## Protection properties

Content that is protected according to the OMA DRM standard is given special properties:

- Content with Forward Lock or Combined Delivery protection cannot be further distributed since the “Send to” option is disabled.
- All three types of protected content (FWL, CD and SD) packages can be stored in the Media memory, thereby enabling storage of large amounts of content.
- OMA DRM Combined Delivery/Forward Lock protected content cannot be used in another device other than the device it was saved on. Only Separate Delivery packages can be used on another device, after obtaining licences to use the content on the new device. Licences to use the content can never be distributed from user to user (phone to phone). Licences always have to be obtained directly from the licence issuer.

## DRM package

DRM packaging software is typically included in the software used by the content provider. It is used to create the DRM package according to the OMA DRM v1 standard before it is delivered to the phone, including content and associated licences.

In Japan, only files with SD protection for playback will be accepted in the Media player and in some European markets DRM content can be used only for automated use/themes, such as ringtones.

# Personalization

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W960 can be personalized by the user in one of the following ways:

- Use of a PC-based utility application.
- Via Over the Air (OTA) configuration, initiated by the operator, user or IT helpdesk.

Alterations to the appearance of many of the screens may be simply carried out through changing the phone's Theme. New themes may be loaded on to W960 from the Internet and other sources.

## Background and application shortcuts

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Users can set a static image to be the background 'wallpaper' for the standby screen. The JPEG, GIF, BMP, WBMP, MBM and PNG formats are supported. Larger images will be resized to fit.

The application shortcut buttons may be personalized by the user.

## Screen saver

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A 'screen saver' image can be displayed after a period of inactivity. The user can switch this facility on and off. Supported formats are the same as for the background image above. Note that the use of animated GIF increases power consumption.

Device lock may be used in combination with the screen saver. Upon pressing a button or touching the screen, the user will be prompted to activate keys and/or enter the device lock code.

When the screen saver is deactivated, the W960 will revert to the state it was in before the screen saver was activated.

## Picture phone book

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The user may store a picture of each contact in the Contacts application. When an incoming call is received with a CLI (Calling Line Identification) matching a phone contact, the contact's picture is displayed together with the other information. The contact's picture is also displayed when making a

call, or using the speed dial screen in picture view mode. A copy of the picture is held in the Contacts database. Therefore, the original picture may be deleted or renamed without losing the copy stored in Contacts.

## Ringtones

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The user can add as many ringtones as desired, subject only to available file space. Ringtones may be collected from many sources including MMS, EMS and transfer from a PC.

Any compatible audio file in the multimedia storage (in Phone memory or Media memory) including MP3 can be selected as a ringtone. The W960 can play both iMelody format ringtones and the following polyphonic formats: AMR, AU, MIDI, RMF (Beatnik), MP3 and WAV.

A system default ringtone is provided. This is the ringtone when the W960 is first initialised. It cannot be deleted and is retained after a master reset.

A personal ringtone may be selected for a contact – simply select the required ringtone while entering or editing the contact's details. When the Calling Line Identification (CLI) of the incoming call is matched to a contact, the personal ringtone for that contact will be played. If the ringtone has been deleted, moved, renamed or is located in the Media memory and the phone is connected to a PC as a USB mass storage device, then the system default ringtone will be played.

If no CLI information is available, then only a default ringtone can be played. If the user has selected a personalized default ringtone and it is available (can be read from the Phone memory or Media memory) then it will be played, otherwise the system default will be played.

## Themes and skins

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A theme or skin is a way to provide a complete customized visual experience for the user.

Themes can define:

- Text, outline and background colours.

- Background images.
- Graphical appearance of interface elements.
- Sounds for events, for example, ring signals, message alerts, notification, area info, auto set-up and reminder.

Themes and skins can be created or downloaded.

## Over-The-Air (OTA) configuration

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OTA remote configuration provides a simple setup of services. The user is spared the task of finding complex technical information and then manually entering it via the user interface. Instead, a Web request or a call to the mobile operator's helpdesk is all that is needed – the appropriate settings are then sent via SMS directly to the phone.

OTA configuration using the OMA Client Provisioning v1.1 (WAP OMA Provisioning) specification – a backward compatible extension of the client provisioning functionality included in WAP 2.0 (v1.0) – enables the following parameters to be provisioned:

- WAP account (account name and WAP Gateway settings).
- ISP settings (bearer information, username, password).
- Browser settings including Bookmark (name and URL).
- OMA DS Sync settings (SyncML).
- MMS settings.
- Email account for POP3, IMAP4 and SMTP including settings (username, password, address, server details).
- OMA Device Management.

## Sony Ericsson phone configurator

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To configure the phone for Internet, email and MMS the necessary settings for many networks can be downloaded from [www.sonyericsson.com/support](http://www.sonyericsson.com/support). This is a free service to owners of Sony Ericsson mobile phones.

## Locks

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W960 has the following lock functionality:

### Keylock

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The Keylock can be turned on or off by:

- A long press on the back key from standby view.

- The standard keypad sequence (# then unlock) from standby view.

Auto keylock is a user setting, only activated from standby.

Keylock can also be turned on from the status bar more menu.

## Phone lock

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The phone lock can be set to 'off', 'at power on' or 'when SIM changed'.

When set to 'at power on' the phone lock code has to be entered every time the phone is turned on.

When set to 'when changing SIM' the phone lock will be activated if the SIM is changed, this prevents other users from using the phone with their SIM without the owner's consent.

The code can be changed by the user as long as they know the current code.

## SIM card lock

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The SIM card lock can be set to 'off' or 'at power on'.

If the SIM card lock is set to 'off' the SIM can be used by any user without the SIM owner's consent.

If the SIM card lock is set to 'at power on', every time the W960 is switched on the user will have to enter a predefined code. The code can be changed by the user as long as they know the current code.

# 3G

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Increased 3G data rates, together with extended multimedia and entertainment content, has enhanced the use of mobile Internet in a revolutionary way.

The 3G (third-generation) service combines high-speed radio access with IP (Internet Protocol)-based services.

The connectionless nature of IP makes access a lot faster – file downloads take less time and we can be connected to a network within a few seconds.

3G has significantly boosted network capacity, allowing operators to support more users and offer more sophisticated services. The W960 is a dual mode phone, meaning the user will be able to use it without having to think about which system is in operation – the handover between the two systems is seamless.

## GSM and WCDMA development

Wideband technology is deployed in parallel with the enhancement of the existing spectrum, re-using parts of the GSM infrastructure. All spectrum assets are valuable, as there is a substantial increase in both the number of subscribers and the volume of traffic in the networks. This seamless solution gives operators a flexible network where the systems interact according to current demand.

## User experience

For the consumers, using a network consisting of GSM, GPRS and WCDMA parts is a seamless experience. GPRS allows qualified mobile Internet applications, while the introduction of WCDMA brings a whole new set of user services, using the full potential of wideband data transport.

## Handover/service continuity

The scope of this text includes service requirements for handover maintaining continuity of service to a wireless terminal, as it moves between the radio coverage area, or “cells”, associated with different base station sites. This functionality is called “handover”. It is a key requirement to allow for dual or multi-mode

terminals to handover traffic from UTRAN to other radio systems such as GERAN and vice versa. This part describes the general principles for service continuity within UMTS Radio Access Network, within GSM/GPRS and between UMTS Radio Access Network and other radio systems such as GSM/GPRS. As a principle, the requirements on service continuity characteristics should be according to the target network on which the service is maintained.

## Service continuity

Service continuity should support the following scenarios:

- Continuity of active circuit-switched services when moving within UMTS Radio Access Network, within GSM/GPRS and between UMTS Radio Access Network and GSM/GPRS coverage areas.
- Continuity of active and packet-switched sessions when moving within UMTS Radio Access Network, within GSM/GPRS and between UMTS Radio Access Network and GSM/GPRS coverage areas.

## General operational considerations

Mechanisms defined to support service continuity between different radio systems or radio access modes should effectively cope with a number of coverage scenarios:

- Limited coverage in a “sea” of coverage provided by another radio system or radio access mode.
- Selective operation at a geographical boundary, with extensive UMTS Radio Access Network coverage on one side, and extensive coverage from another radio system on the other side.
- Geographically co-located areas of UMTS Radio Access Network coverage and another radio system.

## Performance requirements

### Temporary degradation of service caused by handover

During intra-UMTS Radio Access Network handover or handover from UMTS Radio Access Network to GSM/GPRS, degradation of service should be no greater than during intra-GSM/GPRS handover. The duration of the discontinuity experienced by packet-switched and circuit-switched real time services should be shorter than that in the handover of voice calls over GSM/GPRS.

### Requirements on multiple bearer services handover from UMTS radio access network to GSM/GPRS

Consideration must be given to services that may involve multiple bearer services (and simultaneous sessions). The mapping between UMTS Radio Access Network bearer services and GSM/GPRS bearer services depends on many factors such as data rate, delay constraints, error rate etc. In the event that certain UMTS Radio Access Network bearer services cannot be handed over to GSM/GPRS, the handover of some of the bearers to maintain the service should not be precluded.

In the case where a user equipped with a dual mode terminal is in UMTS Radio Access Network coverage, and has multiple PDP contexts activated

(for instance to support multimedia), then it is preferable to handover one PDP context, rather than dropping all of them.

As a first priority only the PDP contexts which have an associated QoS that can be supported by the GSM/GPRS should be candidates for handover.

If there are still multiple PDP contexts as “handover candidates”, then the operator should choose which PDP is maintained. When roaming, the serving network should make this decision. The operator may choose to either:

- Drop all of the PDP contexts.
- Choose one based upon criteria such as duration, amount of traffic transferred, etc.

## Handover in W960

W960 is compliant with the 3GPP™ R99 December 2002 release.

### GSM to UMTS

W960 supports circuit-switched voice handover from GSM to UMTS.

### UMTS to GSM/GPRS

W960 supports packet-switched data handover and circuit-switched voice handover from UMTS to GSM/GPRS.

# Positioning

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The basic cost efficient positioning method available in 3G networks relies on measuring round-trip time. In 3G it is called Cell-ID + TA (Timing in Advance).

Time difference measurement, involving several base stations, can be used to obtain a more accurate position.

Positioning methods are already used to support location-based information services such as ©YellowPages, restaurant guides, traffic information, directions and friend finder

applications. Typically SMS or voice has been used as delivery mechanisms. Java™ and MMS will add new possibilities to deliver attractive location-based applications.



# GPRS

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The introduction of GPRS was a big step in the evolution of GSM networks for enhancing the capabilities of data communication. Data traffic has increased (over both wired and wireless networks), with the growth in demand for Internet access and services paralleling that of mobile communications.

We can now see that the demand for high-speed Internet access is the key driver for coming generations of wireless multimedia and entertainment services, and GPRS is important as a stepping stone when we enter the 3G network era. GPRS has allowed innovative services to be created and granted access to new and previously inaccessible market segments, which will be further developed with 3G.

GPRS is able to take advantage of the global coverage of existing GSM networks. Applications developed for GPRS have been deployed on a large scale and have thus reaped the associated benefits.

With GPRS, W960 sends data in “packets” at a very high speed. The phone remains connected to the network at all times, using transmission capacity only when data is sent or received. Instead of occupying an entire voice channel for the duration of a data session, W960 sends and receives data in small packets, as needed, much like IP on the Internet. Thanks to this, the phone is

always online, using transmission capacity only when data is sent or received. W960 is compatible with GPRS R99. The GSM system limits the ability to use all eight time slots, so W960 uses up to four time slots for receiving data, and up to one slot for transmitting data.

Information about the identity of the phone and the characteristics of the connection are described in the PDP (Packet Data Protocol) context. This information is stored both in the phone and in the mobile network, so that each phone is identified and “visible” to the system.

Using GPRS with W960 has many advantages:

- Constant connection – keep an open connection to an email system or the company network, staying online to receive and send messages at all times. All connection settings can be managed by using the data connections feature.
- High speed – gain access automatically to increased bandwidth when downloading large files such as images.
- Cost efficient – use transmission capacity only when needed, thus reducing costs.
- Email over GPRS – remain connected to an email system while reading and preparing messages (which are then sent at high-speed).

# Symbian OS operating system

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Symbian OS is the open operating system licensed by the world's leading mobile phone manufacturers. It is designed for the specific requirements of advanced 2G, 2.5G and 3G mobile phones. Symbian OS combines the power of an integrated applications environment with mobile telephony, bringing advanced data services to the mass market.

Symbian OS supports a wide range of device categories with several user interfaces, this includes UIQ, which is the software platform used by W960.

# Key features of Symbian OS v9.1

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## General

- Improved system performance, especially at start-up.
- New multimedia framework supporting recording, playback and streaming.
- Graphics – direct access to screen and keyboard gives high performance; graphics accelerator API; increased UI flexibility (support for multiple simultaneous display, multiple display sizes and multiple display orientation).
- Java™ support – supports the latest wireless Java standards. For more information, see “Java™” on page 51.
- Communications protocols – wide area networking stacks including TCP/IP and WAP 2.0, personal area networking support including Bluetooth connectivity and USB; support is also provided for multihoming and link layer Quality-of-Service (QoS) on GPRS and UMTS networks.
- Ready for the 3G market – supports WCDMA (3GPP™ R4), GSM circuit-switched voice and data (CSD), packet-based data (GPRS), SIM, and U-SIM.
- International support – supports the Unicode Standard version 3.0.
- Data synchronization – over-the-air (OTA) synchronization support using OMA standards (OMADS 1.2); PC-based synchronization over USB and Bluetooth connections; a PC Connectivity suite providing the ability to transfer files and synchronize PIM data.
- Improved device management which provides network operators and enterprises with new capabilities to manage phones in the field. This includes OMA DM 1.1.2 support and OMA client provisioning 1.1.
- Support for Bluetooth wireless technology eSCO and Bluetooth stereo headset profiles have been implemented.

## Security

The aims of the security developments in Symbian OS v9.1 are to protect the integrity of the phone, provide extra control over user billable events and to prevent malicious software corrupting executables and data. The aims have been met by:

- Providing platform security by a proactive system defence mechanism based on granting and monitoring application capabilities through

Symbian-signed certification. The infrastructure allows applications to have private protected data stores.

- A proactive defence mechanism against malware. The platform security infrastructure uses a capability-based model, which ensures that sensitive operations, such as, modifying user data, making calls and using network connections, can only be accessed by applications which have been certified by an appropriate signing authority.
- Data caging, which allows applications to have their own private data protection. This allows applications a guaranteed secure data source. This can be used for applications, such as, ecommerce. An application can access other directories marked as open but cannot access another application’s private directory.
- Additional platform security includes full encryption and certificate management, secure protocols (HTTPS, SSL and TLS) and WIM framework.

## EKA2 kernel

- A new realtime kernel (EKA2) with guaranteed response times provides the basis for a robust and power-efficient phone. Predictable real time operation means that the OS will respond to interrupts, system and user threads within a known period. This means that no task in the system can prevent the OS from responding to key tasks.
- Support for multiple simultaneous IP connections.

## Development and testing

- Provides new customization and configurability options for the operating system.
- Symbian OS is built using the ARM RVCT 2.1 compiler. This compiler is compliant with the ARM EABI standard. This allows compatibility with the latest ARM compilers and reduces the Symbian OS footprint while enhancing performance.
- Developing for Symbian OS – native system and application development in C++, supported by CodeWarrior and shortly Eclipse-based IDEs.

Java MIDP 2 supported by all mainstream Java tools. PC-hosted emulator for general development.

## UIQ 3.0

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The new UIQ 3.0 platform offers support for multiple form factors on the same code base and ease of operator configuration.

UIQ 3.0 is based on Symbian OS v9.1 and is equipped to meet the various demands from phone manufacturers, network operators and end users.

- Customization of software is important. UIQ 3.0 offers new features for operator customizations and branding. Sony Ericsson will use these features to configure W960 to meet requirements

from network operators. The same customizations can then be re-used on other UIQ phones with different form factors.

- Developers can utilize the new features of UIQ 3.0 to easily develop applications.
- The SDK (Software Developers Kit) can be used to expand these applications or create new ones. Building blocks, layout managers and a wide range of controls, such as menus and dialogs, make it easier to design applications for UIQ. Using these tools also gives the applications the UIQ look and feel which users are familiar with. The application framework and system services are the basis of the UI platform.

## Java™

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W960 supports Java™ ME CLDC 1.1.

CLDC 1.1 JARs supported:

- JTWI 1.0 (JSR-185) consisting of CLDC (Connected Limited Device Configuration) 1.1 HI (JSR-139), MIDP 2.0 (JSR-118), WMA 1.1 (JSR-120).
- PDA PIM and File Access (JSR-75).
- Bluetooth wireless technology (JSR-82).
- Wireless Messaging API 2.0 (JSR-205).
- Web Service (JSR-172).
- Mobile Media API (JSR-135).
- Mobile 3D Graphics (JSR-184).
- 2D vector graphics API (JSR-226)
- Payment API (JSR-229)
- Nokia UI API 1.1

# W960 consumer package

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The exact contents of the W960 package depend on the localization, but the basic contents are as follows:

- W960 with two styluses
- Battery
- Stereo Portable Handsfree HPM-70
- Travel charger
- USB cable
- User documentation package
- On CD: Sony Ericsson PC Suite for Smart-phones, Media Manager PC program (replaces Disc2Phone)
- Protective pouch

## Accessories

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ACCESSORY	PRODUCT NAME
<b>Batteries</b>	
Standard Battery	BST-33
<b>Home &amp; Office &amp; Power</b>	
Charger	CST-60
Desk Stand	CDS-60
Desk Stand	CDS-65
Headset Charger	CST-61
Home Audio System	MDS-70
Micro Travel Charger	CMT-60
Music Desk Stand	MDS-60
Music Desk Stand II	MDS-65
Music Remote Control	MRC-60
Two Port Standard Charger	CST-75
<b>Handsfree</b>	
Akono™ Headset	HBH-600
Akono™ Headset	HBH-602
Akono™ Headset	HBH-608
Bluetooth™ Headset	HBH-610
Bluetooth™ Headset	HBH-660
Bluetooth™ Headset	HBH-662

Bluetooth™ Headset	HBH-GV435
Bluetooth™ Headset	HBH-GV435a
Bluetooth™ Headset	HBH-IV835
Bluetooth™ Headset	HBH-IV840
Bluetooth™ Headset	HBH-PV700
Bluetooth™ Headset	HBH-PV702
Bluetooth™ Headset	HBH-PV705
Bluetooth™ Headset	HBH-PV710
Mono Portable Handsfree	HPB-62
Portable Handsfree	HPB-60
Sports Portable Handsfree	HPS-60
<b>Personal Music</b>	
Sports Stereo Portable Handsfree	HPM-65
Stereo Bluetooth™ Headset	HBH-DS200
Stereo Bluetooth™ Headset	HBH-DS220
Stereo Bluetooth™ Headset	HBH-DS970
Stereo Bluetooth™ Headset	HBH-DS980
Stereo Portable Handsfree	HPM-64
Stereo Portable Handsfree	HPM-61
Stereo Portable Handsfree	HPM-62
Stereo Portable Handsfree	HPM-64k
Stereo Portable Handsfree with display	HPM-90
Stereo Portable Handsfree with RC	HPM-82
Stereo Portable Handsfree with RC	HPM-85
Streetstyle Stereo Portable Handsfree neckband	HPM-83
Ultra Style Stereo Portable Handsfree	HPM-70
Ultra Style Stereo Portable Handsfree	HPM-75
<b>Car</b>	
Advanced Car Handsfree	HCA-60
Bluetooth™ Car Handsfree	HCB-100E
Bluetooth™ Car Handsfree	HCB-300
Bluetooth™ Car Handsfree	HCB-400

Bluetooth™ Car Speakerphone	HCB-100
Bluetooth™ Car Speakerphone with display	HCB-120
Cigarette Lighter Adapter	CLA-60
Cigarette Lighter Adapter SEMC (small system connector)	CLA-61
Universal Car Holder	HCH-60
<b>Connectivity</b>	
Exclusive USB Cable	DCU-65
USB Cable	DCU-60
<b>Multimedia</b>	
Bluetooth™ Media Centre	MMV-200
Bluetooth™ Music Receiver	MBR-100
Bluetooth™ Wrist Watch	MBW-100
Bluetooth™ Wrist Watch	MBW-150
Music Cable	MMC-60
Music Cable 3.5 mm	MMC-70
Music Radio Transmitter	MMR-60
Music Radio Transmitter	MMR-70
OneGrip Speakers	MPS-75
Portable Speakers	MPS-60
Portable Speakers II	MPS-70
<b>Imageware</b>	
Executive Case	IEC-20

# Technical specifications

## General technical data

Product name	W960
System	Tri-band GSM Release 99 recommendations GSM 900 (CTR 19 and CTR 20) GSM 1800 (CTR 31 and CTR 32) EGSM and WCDMA FDD mode supported Latin America 1800, 1900 and e-GSM mode supported
Speech coding	HR, FR, EFR, AMR supported where available, for high speech quality
Operating system	Symbian OS v9.1 UIQ 3.0
Processor	ARM
GSM SIM/ UMTS USIM card	GSM SIM - GSM 11.11, UMTS USIM - 3GPP™ TS 31.102. Small plug-in card, 1,8 V and 3 V
Internal memory size (for user data)	160 MB + 8 GB
Data transfer speeds	USB High-speed, up to 480 Mbps
Length	109 mm
Width	55 mm
Thickness	16 mm
Weight	119 g
Antenna	Built-in
Colours	Vinyl Black
Battery	900 mAh

## Screen

Display type	TFT
Display size	QVGA
Pixel size	240 x 320
Colour resolution	262 k
Screen surface	Touch-sensitive
Illumination	Variable intensity backlight

## Performance and technical characteristics

Dimension	GSM 900/ E-GSM 900	GSM 1800	GSM 1900	WCDMA
Frequency range (MHz)	TX: 880 – 915 RX: 925 – 960	TX: 1710 – 1785 RX: 1805 – 1880	TX: 1850 – 1910 RX: 1930 – 1990	TX:1920 – 1980 RX:2110 – 2170
Channel spacing	200 kHz	200 kHz	200 kHz	5 MHz with 200 kHz channel rasters
Number of channels	174 Carriers *8 (TDMA)	374 Carriers *8 (TDMA)	299 Carriers *8 (TDMA)	277
Modulation	GMSK	GMSK	GMSK	QPSK
TX Phase Accuracy	< 5° RMS Phase error (burst)	< 5° RMS Phase error (burst)	< 5° RMS Phase error (burst)	Error Vector Magnitude: <17.5%
Duplex spacing	45 MHz	95 MHz	80 MHz	190 MHz
Frequency stability	+/- 0.1 ppm	+/- 0.1 ppm	+/- 0.1 ppm	+/- 0.1 ppm
Voltage operation (nominal)	3.6 V	3.6 V	3.6 V	3.6 V
Transmitter RF power output	33 dBm Class 4 (2 W peak)	30 dBm Class 1 (1 W peak)	30 dBm Class 1 (1 W peak)	24dBm Class 3 (0.25 W peak)
Transmitter Output impedance	50 $\Omega$	50 $\Omega$	50 $\Omega$	50 $\Omega$
Transmitter Spurious emission	< -36 dBm up to 1 GHz < -30 dBm over 1 GHz (according to GSM spec)	< -30 dBm (according to GSM spec.)	< -30 dBm (according to GSM spec.)	< -36 dBm up to 1 GHz < -30 dBm over 1 GHz (according to 3GPP™ spec)
Receiver RF level	Better than – 102 dBm	– 102 dBm	Better than – 102 dBm	Better than – 106.7 dBm @ 12.2 kbps CS voice
Receiver RX Bit error rate	< 2.4%	< 2.4%	< 2.4%	< 0.1%

## Current consumption, talk and standby times

Talk time	GSM up to 7.5 hours UMTS up to 2.5 hours
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Operating time	Up to 8 hours Music playback up to 27 hours
Standby time	GSM up to 340 hours UMTS up to 250 hours

## USSD technical data

Feature	Support
USSD support	GSM Phase 1/2 (Cross-phase compatibility). GPRS behaviour according to class B.
Mode support -mode	UI-mode supported. SAT initiated USSD supported.
UI-mode details	<ul style="list-style-type: none"> <li>• Possible to scroll the text up and down in USSD messages.</li> <li>• Possible to highlight embedded numbers and take actions accordingly.</li> </ul>

## GPRS technical data

Dimension	Support
Compatible GPRS and SMG specifications	Release 99 according to ETSI specification.
Data rates	Multislot class 10 supported (4+2) CS-1, CS-2, CS-3, CS-4 9,050 bps, 13,400 bps, 15,600 bps, 21,400 bps supported (network-dependent).
Medium Access Modes	Dynamic allocation
Support of Packet Control Channels (PBCCH/PCCCH)	Yes
Network operation mode	NOM I, II, III
Support of GPRS/CS combined procedures	Yes
Network control mode	NC0 and 2
Support of access in 2 phases	Yes
Support of PRACH on 11 bits	Yes
Support of GPRS re-selection C31/C32	Yes
Support of static and dynamic addressing	Yes

Dimension	Support
Support of power control Uplink and Downlink	Uplink = yes, Downlink is a network feature.
Support of ciphering algorithms	GEA1, GEA2
Support of compression algorithms	Yes, V42bis and IP header compression.
Mode of operation	Class B and Class C modes of operation supported.
R Reference point	Physical layer: Support of RS232 PPP is supported as L2 layer in the R reference point Authentication algorithms PAP, CHAP supported
IP connectivity	PDP type IP is supported IP termination in mobile or TE (laptop, PDA) supported
PDP context	10 PDP context descriptions stored in mobile PDP context description is edited via application in mobile, AT-command or via OTA Simultaneous PDP contexts are supported, maximum 2.
SIM	GPRS aware and non-GPRS aware SIM cards are supported.
AT commands supported	<div> AT+CGDCONT - DEFINE PDP CONTEXT  AT+CGQREQ - Quality of Service Profile (REQUESTED)  AT+CGQMIN - Quality of Service Profile (Minimum Acceptable)  AT+CGATT - PACKET DOMAIN SERVICE ATTACH OR DETACH </div> <div> AT+CGACT - PDP CONTEXT ACTIVATE OR DEACTIVATE  AT+CGDATA - ENT </div>

## GPRS maximum data rates (Kpbs)

		CS-1 9.05 Kbps	CS-2 13.5 Kbps	CS-3 15.6 Kbps	CS-4 21.4 Kbps
4 + 1	Rx	36.2	53.6	62.4	85.6
	Tx	9.05	13.4	15.6	21.4

## HSCSD maximum data rates (Kpbs)

		9.6 Kbps per timeslot	14.4 Kbps per timeslot
2 + 1	Rx	19.2	28.8
	Tx	9.6	14.4

## Hardware buttons

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On/Off button

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Keypad with 12 keys

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Walkman® key

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C (Cancel) key

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Jog Dial, 3-way: up, down and inward

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Back button to switch back a view. Pressing and holding turns the keylock on and off when in standby view.

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Play/stop button for the Walkman® player. Also mutes/unmutes the FM Radio.

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Volume up/down rocker key. Long press on this button skips to previous or next track or radio station.

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## Text input

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Numeric keypad-based predictive text input.

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Handwriting recognition and on-screen keyboard with advanced text prediction, including automatic word completion and next word and spelling suggestions.

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## Third party application support

**Note:** The list below may be subject to future updates, that is, new applications may be added, others removed.

Application	
Accuweather – Offers access to a wealth of world-wide weather. Detailed current conditions give the user a look at what the weather is currently doing for their location, or for any of thousands of locations around the world.	Try & Buy application from Accuweather
Audible Air – Digital audio books, newspapers and programs from Audible, the Internet's leading provider of spoken word audio.	Try & Buy application from Audible

<b>Application</b>	
Boingo Mobile – Provides Wi-Fi access in tens of thousands of hot spots around the globe for all enabled services on the W960 – VoIP, browsing, uploading, downloading, and so on.	Try & Buy application from Boingo
Chess Professional – Multi-award winning chess application, renowned for its superb playability for players of all levels.	Try & Buy application from ZingMagic
Crystal Arabic – Used to create, send and receive notes, sheets, documents, calendar entries, email, messages, contacts, and more in the Arabic language.	Try & Buy application from Psiloc
Crystal Hebrew – Used to create, send and receive notes, sheets, documents, calendar entries, email, messages, contacts, and more in the Hebrew language.	Try & Buy application from Psiloc
Crystal Hindi – Used to create, send and receive notes, sheets, documents, calendar entries, email, messages, contacts, and more in the Hindi language.	Try & Buy application from Psiloc
Crystal Thai – Used to create, send and receive notes, sheets, documents, calendar entries, email, messages, contacts, and more in the Thai language.	Try & Buy application from Psiloc
EMO (Ericsson Mobile Organizer) – Easy-to-use access for enterprise users to corporate email and other PIM data on the move.	Try & Buy application from Ericsson
File Encryption –	Try & Buy application from Pointsec
Firewall – Protection against hackers, data-stealing applications and identity theft.	Try & Buy application from McAfee
Google Gmail – Webmail designed for mobile phones.	Free application from Google
Google Mobile Maps – Lets a user easily find a location and get directions on how to go there.	Free application from Google

<b>Application</b>	
Handy Day – Personal assistant keeping track of appointments and tasks. Quick and convenient access to applications, files and contacts.	Try & Buy application from Epocware
Handy Expense – Where is the money gone during business trips. Handy Expense keeps track of them, and also compiles expense reports.	Try & Buy application from Epocware
Handy Safe – A perfect assistant for secure and convenient management of data, like passwords, credit card details, user names, accounts, Web pages, and insurance policies.	Try & Buy application from Epocware
iSkoot – Solution for making and receiving Skype calls on the W960. iSkoot eliminates the need for special hardware and consumers don't have to go looking for a WiFi hot spot.	Try & Buy application from iSkoot
Mobile Blogger – Helps users create their own free personal photo albums and start sharing them immediately.	Free application from Google
Music Mate 3 –	Free application from Vitamin SE
Optimobile – Solutions for seamless handover between WiFi and GSM/ 3G.	Application from Optimobile N.B. This application can only be installed directly from operator.
Personal Assistant –	Try & Buy application from Dialogue Technologies
Photoword – The world's first cellphone dictionary. Uses the camera to read and translate text.	Try & Buy application from 3G Vision
Pocket Tunes –	Try & Buy application from Normsoft Inc
Raging Thunder – 3D (Open GL) racing game.	Try & Buy application from Telcogames
SEMC LFTV – Allows the user to enjoy video content, both at home and on the go. To make use of LFTV, a separate device called LocationFree Base Station is needed.	Free application from Sony
ShoZu 3.0 – Free phone service that makes it incredibly easy to send and receive photos, videos and music while on the move.	Free application from Cognima

<b>Application</b>	
Speero Voice Translator – The user just says a phrase in one of three languages (English, Japanese or Spanish) and gets it immediately translated into one of the other languages.	Try & Buy application from Speero
Virus Scan Mobile – The leading solution for real-time protection against viruses, worms, Trojans and so on.	Try & Buy application from McAfee
Wayfinder Navigator – Together with a Bluetooth GPS, turns the phone into a top-of-the-line GPS Navigator. Editor's choice Mobile Magazine 2005.	Try & Buy application from Wayfinder
WorldMate – World clock, global weather forecasts, comprehensive flight schedules for over 800 airlines, and much more.	Try & Buy application from Mobimate

## Walkman® player

File formats	.3ga - 3GPP™ Multimedia File .3gp - 3GPP™ Multimedia File .aac - Advanced Audio Coding .amr - Adaptive Multi-Rate Codec .au - uLaw/AU Audio File .imy - iMelody Ringtone Format .jts - MMAPI built-in Tone sequence .m4a - MPEG-4 Audio File .mid - Midi Melody (MusicDJ™) .mid - Scalable Polyphony MIDI .midi - Musical Instrument Digital Interface .mmf - SMAF (Synthetic music Mobile Application Format) .mp3 - MPEG Audio Stream, Layer III .mp4 - MPEG-4 Audio File .mxmf - Mobile XMF (eXtensible Music Format) .ra - Real Media .ram - Real Media .rmf - Beatnik Rich Music Format .rng - Nokia Ringtone Format .wav - Waveform Audio .wma - Windows Media Audio .xmf - eXtensible Music Format
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Audio decoding	iMelody AMR-NB Midi SP-Midi XMF DLS MPEG-4 AAC-LC aacPlus (HE AAC, AAC+) Enhanced aacPlus (EAAC+) MPEG-1 1/2/2.5 Layer 3 (MP3) WAV Real Audio 9 WMA, Windows Media Audio 9
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## Video player

File Format	.3gp <sup>a</sup> - 3GPP™ Multimedia File .mp4 <sup>b</sup> - MPEG-4 Video File .pvx - Packet Video Streaming .ram - Real Media .rm - Real Media .sdp - SDP format .wmv - Windows Media Video 9
Streaming transport	RTSP according to 3GPP™
Video decoding	MPEG-4 Simple Visual Profile, Levels 0-3 H.263 Profile 0, Level 10 H.263 Profile 3, Level 10 H.264 Baseline profile, Level 1b Real Video version 8 Real Video version 9 Windows Media Video 9

a.AAC-LC and AMR-NB audio supported

b.AAC-LC and AMR-NB audio supported

## Pictures

Formats	JPEG, BMP, GIF (including animated), PNG, MBM, WBMP, SVG-tiny
Sharing via	Bluetooth wireless technology, MMS, Email, PC file transfer, USB

## Image decoders

Decoder	Details	Size	Colour depth	File format
GIF	87a/89a			
JPEG	ISO/IEC JPEG <ul style="list-style-type: none"> <li>• Baseline DCT</li> <li>• Progressive DCT</li> <li>• Non-differential</li> <li>• Huffman coding</li> <li>• Symbol 'SOF2'</li> </ul>	Megapixel		<ul style="list-style-type: none"> <li>• JFIF v1.02</li> <li>• EXIF</li> </ul>
BMP	The bitmap image format used by Windows®.	XRAM dependent, default is VGA.	18-bit	
WBMP				
PNG				

## Image encoders

Decoder	Details	Size	Colour depth	File format
GIF	89a			
JPEG	ISO/IEC JPEG <ul style="list-style-type: none"> <li>• Baseline DCT</li> <li>• Non-differential</li> <li>• Huffman coding</li> <li>• Symbol 'SOF0'</li> </ul>	Megapixel		JFIF v1.02
BMP	The bitmap image format used by Windows®.	XRAM dependent. Default is VGA.	18-bit	
WBMP				

## Short message service

Feature	Support in W960
SMS Centre Number	It is possible to pre-record the SMS Centre Number.
Pictures	It is possible to insert a picture or an icon into the text message. EMS compliant mobile handsets will be able to see the picture correctly.
Input methods	Keyboard, on-screen keyboard, touchscreen, predictive text input and multitap.
Reply to messages	It is possible to reply to received messages by MMS, SMS or phone call.
Copy, cut and paste words	Yes



Feature	Support in W960
Teaching of predictive words that are not in the predictive dictionary	Yes
Possibilities when creating a message:	
Save a sent message in a “sent items” folder	Yes
Insert a line in the message	Yes
Assign a validity period to the message	Yes
Print via IrDA	No IrDA functionality in phone
Use pre-defined messages	No
Possibilities when receiving a message:	
Reply to the sender	Yes
Forward the message	Yes
Save the message on SIM	No
Get delivery time and date	Yes, but not via messaging
Print via IrDA	No IrDA functionality in phone
Possibilities of the previously sent message:	
Delivery report of the message	Yes
Forward the message	Yes
Save the message on SIM	Yes
Know the remaining capacity storage	Yes
Print via IrDA	No IrDA functionality in phone
Possibilities of the previously received message:	
Reply to the sender	Yes
Save the message in the Inbox	Yes
Forward the message	Yes
Know the remaining capacity storage	Yes
Supported ways for replying to a received SMS:	
Via SMS	Yes
Via phone call (set up a call to the number contained in the message body)	Yes
Via USSD session	No

Feature	Support in W960
Possibility to offer the user the ability of sending an SMS to a list of recipients	Yes, using phonebook groups or entering multiple numbers manually.
Possibility to write an email address as a recipient address	No
SMS storage	In handset and SIM.
Nokia Picture Messaging	No

## Enhanced message service

Feature	Support in the W960
Level of compliance supported by the handset regarding the specifications described in release 99.	Enhanced Messaging Service (EMS) according to the standard 3GPP™ TS 23.040 v4.3.0, with the addition of the ODI feature from 3GPP™ TS 23.040 v5.0.0.
Outgoing messages	It is possible to: <ul style="list-style-type: none"> <li>• See how many short messages an EMS message consists of before sending it.</li> <li>• Choose whether to send the message or not after writing it.</li> </ul>
Incoming messages	<ul style="list-style-type: none"> <li>• A signal is heard once all parts of the message have been received.</li> <li>• It is possible to re-use the content of an EMS message. Sounds, pictures, and animations can be inserted in a new message, if the object is not protected using ODI.</li> </ul>
Concatenated messages	A receipt is received in the handset when all parts of a concatenated message have been delivered.
Insert objects	It is possible to add pictures, animations and sounds to an EMS message.
Text formatting	<ul style="list-style-type: none"> <li>• Centred, left and right aligned text.</li> <li>• Small, normal and large font size.</li> <li>• Bold, italic, underlined and strikethrough style.</li> </ul>
Sounds	Chimes high, chimes low, ding, tada, notify, drum, claps, fanfare, chords high, chords low.
I-melody	Yes, version 1.2.
Melodies	It is possible to: <ul style="list-style-type: none"> <li>• Send and receive melodies via EMS, if the melodies are not protected by copyright.</li> <li>• Download melodies and commercial tunes.</li> <li>• Create melodies.</li> </ul>
WBMP	Yes
Picture sizes	16 x 16 mm, 32 x 32 mm, variable size in black and white.

Feature	Support in the W960
Pictures	<p>It is possible to:</p> <ul style="list-style-type: none"> <li>• Edit pictures.</li> <li>• Send and receive pictures via EMS, if the pictures are not protected by copyright.</li> <li>• Create pictures.</li> <li>• Download pictures.</li> <li>• Receive pictures in enhanced messages originated by service providers.</li> </ul>
Animations	<p>The handset supports the following animations: I am ironic, I am glad, I am sceptic, I am sad, WOW!, I am crying. Plus the other nine animations defined in 23.040 v4.3.0.</p> <p>It is possible to send and receive animations.</p>
TP-PID field value given by the handset before sending an EMS message	0x00

## Multimedia messaging service

Feature	Support in the W960
Support of MMS protocol stack version	1.2
MMS/circuit-switched parameters and MMS/packet-switched parameters placement	MMS is bound to a Data Account. A Data Account contains either circuit-switched parameters or packet-switched parameters.
Possibility to pre-configure the MMS parameters in factory	<ul style="list-style-type: none"> <li>• MMS circuit-switched: Yes</li> <li>• MMS packet-switched: Yes</li> </ul>
Possibility to configure the MMS parameters by OTA provisioning	<ul style="list-style-type: none"> <li>• MMS circuit-switched: Yes</li> <li>• MMS packet-switched: Yes</li> </ul>
Possibility for all the parameters from the parameters set to be OTA provisioned at the same time	<ul style="list-style-type: none"> <li>• MMS circuit-switched: Yes</li> <li>• MMS packet-switched: Yes</li> </ul>
Possibility for only one parameter from the parameters set to be OTA provisioned	<p>Using Device Management:</p> <ul style="list-style-type: none"> <li>• MMS circuit-switched: Yes</li> <li>• MMS packet-switched: Yes</li> </ul> <p>Using Client Provisioning:</p> <ul style="list-style-type: none"> <li>• MMS circuit-switched: No</li> <li>• MMS packet-switched: No</li> </ul>
OTA provisioning solution	OMA Device Management and OMA Client Provisioning supported
MMS User Agent functional entity will be a separate entity from Web browser:	Yes
MMS User Agent support	OMA UAProf.

Feature	Support in the W960
Supplier indication of realized interoperability tests between its MMS User Agent and MMS Relay/Server from other suppliers	Yes
Support of a standard or a proprietary procedure for OTA provisioning of MMS parameters	OMA Device Management and OMA Client Provisioning
Functionalities that the user is able to set during message composition:	<ul style="list-style-type: none"> <li>• Message <i>subject</i></li> <li>• MSISDN recipient address</li> <li>• <i>email</i> recipient address</li> <li>• Message <i>Cc</i> recipient(s) address(es)</li> <li>• <i>delivery report</i> request</li> <li>• <i>read-reply</i> report request</li> <li>• <i>message</i> priority</li> <li>• <i>validity</i> period</li> </ul>
From where can the user insert multimedia elements into multimedia messages:	<ul style="list-style-type: none"> <li>• Terminal memory</li> </ul>
Supplier indication if MMS User Agent will be able to handle a network-based address book	No
Possibility for sent messages to be memorized into a folder in handset memory	Yes
Actions that the user can perform after message notification:	<ul style="list-style-type: none"> <li>• Retrieve the message immediately</li> <li>• Defer message retrieval</li> <li>• Reject message</li> </ul>
Actions that the user can perform after message retrieval:	<ul style="list-style-type: none"> <li>• Reply to the sender of the message</li> <li>• Reply to the sender and to Cc people</li> <li>• Forward the message</li> <li>• Delete the message</li> <li>• Save message into terminal</li> </ul>
Multimedia codecs/formats supported for audio	AMR, MP3, AAC, WAV Depending on content class/creation mode settings, the following formats are also supported: AAC-LC AMR-NB SP-MIDI XMF DLS Real Audio
Multimedia codecs/formats supported for video	MP4, H263 Depending on content class/creation mode settings, the following format is also supported: Real Video
Multimedia codecs/formats supported for image	Baseline JPEG, wbmp, SVG, GIF 89a

Feature	Support in the W960
MMS User Agent provides:	<ul style="list-style-type: none"> <li>• Text formatting facilities (only text size)</li> <li>• Coloured text/background (Viewer/player supports coloured text and background.)</li> <li>• Keyboard, On-screen keyboard, touchscreen and predictive text input.</li> </ul>
Support of MMS protocol stack version	1.2
MMS/circuit-switched parameters and MMS/packet-switched parameters placement	MMS is bound to a Data Account. A Data Account contains either circuit-switched parameters or packet-switched parameters.
Possibility to pre-configure the MMS parameters in factory	<ul style="list-style-type: none"> <li>• MMS circuit-switched: Yes</li> <li>• MMS packet-switched: Yes</li> </ul>
Possibility to configure the MMS parameters by OTA provisioning	<ul style="list-style-type: none"> <li>• MMS circuit-switched: Yes</li> <li>• MMS packet-switched: Yes</li> </ul>

## SIM AT services supported

Service	Mode	Support
CALL CONTROL BY SIM		Yes
DATA DOWNLOAD TO SIM	Cell Broadcast SMS	Yes Yes
DISPLAY TEXT	Text of up to 240 characters (120 UCS2 coded).	Yes
	bit 1: 0 = normal priority	Yes
	1 = high priority	Yes
	bit 8: 0 = clear message after a delay	Yes
	1 = wait for user to clear message	Yes
GET INKEY	General: The GET_INKEY requires that the user confirms his/her choice	Yes
	bit 1: 0 = digits (0-9, *, # and +) only	Yes
	1 = alphabet set	Yes
	bit 2: 0 = SMS default alphabet	Yes
	1 = UCS2 alphabet	Yes
	bit 3: 0 = character sets defined by bit 1 and bit 2 are enabled	Yes
	1 = character sets defined by bit 1 and bit 2 are disabled and the Yes/No response is requested	Yes

Service	Mode	Support
GET INPUT	General: No. of hidden input characters	252
	bit 1: 0 = digits (0-9, *, # and +) only	Yes
	1 = alphabet set	Yes
	bit 2: 0 = SMS default alphabet	Yes
	1 = UCS2 alphabet	Yes
	bit 3: 0 = ME may echo user input on the display	Yes
	1 = user input not to be revealed in any way (see note)	Yes
	bit 4: 0 = user input to be in unpacked format	Yes
	1 = user input to be in SMS packed format	Yes
	bit 8: 0 = no help information available	Yes
	1 = help information available	Yes
LAUNCH BROWSER		Yes
MORE TIME		Yes
PLAY TONE		Yes
POLLING OFF		Yes
POLL INTERVAL		Yes
PROVIDE LOCAL INFORMATION	'00' = Location Information (MCC, MNC, LAC and Cell Identity)	Yes
	'01' = IMEI of the ME	Yes
	'02' = Network Measurement results	Yes
	'03' = Date, time and time zone (DTTinPLI)	Yes
	'04' - Language setting	Yes
	'05' - Timing setting	Yes
REFRESH	General: The reset option requests the user to wait while the phone restarts	Yes
	'00' =SIM Initialization and Full File Change Notification	Yes
	'01' = File Change Notification	Yes
	'02' = SIM Initialization and File Change Notification	Yes
	'03' = SIM Initialization	Yes
	'04' = SIM Reset	Yes
SELECT ITEM		Yes
SEND DTMF		Yes

Service	Mode	Support
SEND SHORT MESSAGE	bit 1: 0 = packing not required	Yes
	1 = SMS packing by the ME required	Yes
SEND SS		Yes
SEND USSD		Yes
SET UP CALL	General: Capability configuration	Yes
	Set up speech call CallParty	No
	Subaddress DTMF support	Yes
	'00' = set up call, but only if not currently busy on another call	Yes
	'01' = set up call, but only if not currently busy on another call, with re-dial	Yes
	'02' = set up call, putting all other calls (if any) on hold	Yes
	'03' = set up call, putting all other calls (if any) on hold, with re-dial	Yes
	'04' = set up call, disconnecting all other calls (if any)	Yes
	'05' = set up call, disconnecting all other calls (if any), with re-dial	Yes
SET UP EVENT LIST	'00' = MT call	Yes
	'01' = Call connected	Yes
	'02' = Call disconnected	Yes
	'03' = Location status	Yes
	'04' = User activity	Yes
	'05' = Idle screen available	Yes
	'06' = Card reader status	Not Applicable
	'07' = Language selection	Yes
	'08' = Browser termination	Yes
	'09' = Data available	No
	'0A' = Channel status	No
SET UP IDLE MODE TEXT		Yes, 1 row of text is supported
SET UP MENU		Yes
TIMER MANAGEMENT		Yes

Service	Mode	Support
OPEN CHANNEL		No
CLOSE CHANNEL		No
RECEIVE DATA		No
SEND DATA		No
GET CHANNEL STATUS		No

## User interaction with SIM AT

### Display text

Text of up to 240 characters (120 UCS coded) is supported.

Text clearing times are 5-20 seconds and a 60 second timeout limit for the user to clear the text.

'Key' responses:

- 'Long Back' – Proactive session terminated by user.
- 'Back' – Backward move in proactive session.

Any other key clears the display if the command is performed successfully.

### Get inkey

Prompt for a one-character input. Pressing 'Ok' without entering a character gives warning message "Minimum 1 character". 'Key' responses:

- 'C' clears current character.
- 'Long Back' terminates the proactive session.
- 'Back' – Backward move in proactive session.
- 'OK' – Command performed successfully.

### Get input

Prompt for character input. The phone will refuse to accept further input when maximum response length is exceeded. UI Maximum Response lengths:

- Digits Only – 160 characters.
- SMS default alphabet characters – 160 characters, or 1530 characters if concatenation is activated.
- Hidden Characters (digits only) – 20 characters.

'Key' responses:

- 'C' clears current character.
- 'Long Back' terminates the proactive session.
- 'Back' – Backward move in proactive session.
- 'OK' – Command performed successfully.

### Select item

Scroll to highlight item for selection. 'Key' responses:

- Navigational key press down – Scroll down list.
- Navigational key press up – Scroll up list.
- Long 'Back' terminates proactive session.
- 'Back' – Backward move in proactive session.
- 'OK' – Command performed successfully.

### Send short message

Default message "Sending message, please wait" can be replaced for the Alpha Identifier text, or sup-pressed completely if a null text is provided. Default responses are "MESSAGE FAILED" or "MESSAGE SENT". 'Key' responses:

- Long 'Back' or 'Back' ends the proactive session.

### Set up call

If the ME is on a call when the command 'Set up Call', 'putting all other calls on hold' is sent, the user will see the text 'Setting up a call current call will be held'. If 'OK' is pressed the current call will be put on hold and the new call set up.



## Integrated browser technical data

Security	WTLS Class 1, 2, 3; WTLS Cipher RC5 with key length 128TLS/SSL; TLS Cipher RC4 with key length 128SignText
Certificates	Predefined: Baltimore, Entrust, GlobalSign, GTA Cybertrust, RSA, Thawte and VeriSign.

## Security

Data protection	SIM PIN (at power on)Device Lock (at power on and/or activated by screen saver)
Browser	TLS, SSL, WTLS, Certificate handling
Third party applications	Support for signed applications

# Abbreviations

## **3GPP™**

3rd Generation Partnership Project.

## **AAC**

Advanced Audio Codec.

## **ALS**

Alternate Line Service. A system that allows a user to have more than one line allocated to a single SIM subscription.

## **AMR**

Adaptive Multi-Rate. A variable rate speech coding (compression) method selected by the 3GPP™ for the 3G evolution of the GSM phones.

## **API**

Application Programming Interface

## **AU, .au**

Format for audio data files.

## **Bluetooth**

Bluetooth wireless technology is a secure, fast, point-to-multipoint radio connection technology. It is a specification for a small-form factor, low-cost radio solution providing links between mobile computers, mobile phones and other portable handheld devices, and connectivity to the Internet. Available from the Bluetooth Special Interest Group (SIG).

## **BMP**

Microsoft Windows Bitmap. A graphics format defined by Microsoft supporting 1, 4, 8 or 18-bit colour depth. No compression, so files can be large.

## **bps**

Bits per second – rate of data flow.

## **CB**

Cell Broadcast. Type of SMS message.

## **cHTML**

A version of HTML optimized for small devices.

## **CLDC**

Connected Limited Device Configuration. The J2ME 'configuration' implemented in W960. CLDC specifies a runtime environment with specifically limited resources, suitable for memory-constrained devices.

## **CLI**

Calling Line Identity. Shows the number of the person calling in the mobile phone display. W960 will also display the name and photo of the caller if this information has been stored in Contacts.

The user can then make an informed choice as to whether or not to take the call. Not all numbers can be displayed! To use this service, it must be supported by the user's network.

## **COM Port**

Defines a serial/RS-232 port within the Windows environment. May be physical (COM1 port on the rear of the PC) or virtual (COM5 port communicating with a PC card modem).

## **CS**

Circuit-switched. Connection from A to B which has a fixed bandwidth and is maintained over a period of time, such as, a voice telephone call.

## **CS-1 to CS-4**

Coding Scheme. Determines the data rate per timeslot in GPRS.

**CSD**

Circuit-switched Data. CSD is a GSM service providing a CS data connection at a rate of 9.6 or 14.4 Kbps.

**CSS**

Cascading Style Sheet. A feature of browsers.

**DCIM**

Digital Camera Images. The name of the root directory when storing images according to the Design rule for Camera File system (DCF) standard.

**DRM**

Digital Rights Management; controlling copying and distribution of contents, with respect to intellectual property rights.

**DTMF**

Dual Tone Multi Frequency. A method of coding digits as a combination of two audible tones.

**DUN**

Dial-Up Networking.

**ECML**

Electronic Commerce Modelling Language.

**e-GSM**

Extended GSM. New frequencies specified by the European Radio Communications Committee (ERC) for GSM use when additional spectrum is needed (Network-dependent). It allows operators to transmit and receive just outside GSM's core 900MHz frequency band. This extension gives increased network capability.

**EMS**

Enhanced Messaging Service. An extension of SMS enabling pictures, animations, sound and text formatting to be added to text messages. 3GPP™ has included EMS in the standards for SMS.

**ETSI**

European Telecommunications Standards Institute.

**FCC**

Federal Communications Commission. US government agency which regulates radio communications.

**FR**

Full Rate, speech coding.

**GIF**

Graphics Interchange Format. Format for storing images which also supports animated images. Highly compressed by limiting the colour palette to 16 or 256 colours.

**G-MIDI**

General MIDI. Specifies a minimum level of performance compatibility.

**GPRS**

General Packet Radio Services.

**GSM**

Global System for Mobile Communications. GSM is the world's most widely-used digital mobile phone system, now operating in over 160 countries around the world.

**GSM 900**

The GSM system family includes GSM 900, GSM 1810 and GSM 1900. There are different phases of roll-out for the GSM system and GSM phones are either phase 1 or phase 2 compliant.

**GSM 1810**

Also known as DCS 1810 or PCN, this is a GSM digital network working on a frequency of 1810 MHz. It is used in Europe and Asia-Pacific.

**GSM 1900**

Also known as PCS. Refers to a GSM system running in the 1900MHz band. Used in the USA and Canada, for instance.

**HR**

Half Rate, speech coding.

## **HSCSD**

High Speed Circuit-switched Data.

## **HTML**

HyperText Markup Language.

## **HTTP**

HyperText Transfer Protocol.

## **IMAP4**

Internet Message Access Protocol version 4. Used to collect email from a mail server. Has more features than POP3.

## **iMelody**

A format for monophonic ringtones.

## **IrDA**

Infrared Data Association.

## **ISDN**

Integrated Services Digital Network. Can provide circuit-switched data connections in multiples of 64 Kbps.

## **ISP**

Internet Service Provider.

## **J2ME™**

Java2™ Micro Edition – an edition of the Sun Microsystems Java programming/runtime environment specifying two runtime environment 'configurations' aimed at small devices.

## **Java™ Phone**

An API in Java™ used for interacting with a phone.

## **JFIF**

JPEG File Interchange Format

## **JNI™**

Java™ Native Interface

## **JPEG**

Joint Photographic Experts Group, best known for the .JPG format for still image compression.

## **JVM™**

Java™ Virtual Machine

## **Kbps**

Kilobits per second – rate of data flow.

## **KVM**

'Kilo' Virtual Machine.

## **LAN**

Local Area Network.

## **MAC Address**

Media Access Control address. This is a hardware address that uniquely identifies each node on a network.

## **MBM**

Multi Bitmap. Image file format on Symbian OS.

## **ME**

Mobile Equipment. (Phone excluding SIM card)

## **MeT**

Mobile Electronic Transactions. An initiative founded by Ericsson, Nokia and Motorola to establish a secure and consistent framework for mobile transactions.

## **MIDI**

Musical Instrument Digital Interface. MIDI defines a protocol and file format which enables music to be described and stored in binary form.

## **MIDP**

Mobile Information Device Profile. An API (or 'profile' in J2ME nomenclature) defined to enable a standard programming API for mobile devices. MIDP compliant applications execute in the restricted environment defined by the CLDC.

**MIME**

Multipurpose Internet Mail Extensions. A protocol defining how messages are sent on the Internet. MIME is used to describe how attachments are encoded and what type of data they contain.

**MMS**

Multimedia Messaging Service. Logical extension of SMS and EMS, MMS defines a service enabling sound, images and video to be combined into multimedia messages.

**MMS-C**

MMS Service Centre.

**MO**

Mobile Origination. Such as, an SMS message sent from a mobile terminal.

**MP3**

MPEG Audio Layer 3. An audio compression technology that is part of MPEG-1 and MPEG-2 specifications. Commonly used to distribute music on the Internet and on portable players.

**MPEG**

Moving Picture Experts Group. A working group of ISO/IEC in charge of the development of standards for coded representation of digital audio and video.

**MS**

Mobile Station. (Phone and SIM card)

**MT**

Mobile Termination.

**OS**

Operating System, such as Symbian OS, Linux, Microsoft Windows.

**OTA**

Over-the Air Configuration. To provide settings for the phone by way of sending a message, SMS, over the network to the phone. This reduces the need for the user to configure the phone manually.

**PC**

Personal Computer.

**PCS**

Personal Communications Services, often used to describe GSM1900 networks.

**PDA**

Personal Digital Assistant. A handheld computer having functions such as address book, calendar etc.

**PDP**

Packet Data Protocol.

**Personal Java™**

An edition of Java™ appropriate for mobile devices such as PDAs.

**Phone book**

A memory in the SIM card where phone numbers can be stored and accessed by name or position.

**PIM**

Personal Information Management. Generic term for applications such as Contacts, Calendar, Tasks etc.

**PKI**

Public Key Infrastructure.

**PNG**

Portable Network Graphics. Format for storing images on file with data compression but without lowering of quality (loss of information).

**POP3**

Post Office Protocol. Used to collect email from a mail server.

**PSTN**

Public Switched Telephone Network, such as, ordinary analogue phone line for speech and/or computer modem.

**PTD**

Personal Trusted Device. Concept in MeT.

**QCIF**

Quarter Common Intermediate Format. A video format size of 176 x 144 lines.

**QQVGA**

Quarter Quarter VGA, 160 x 120 pixels.

**QVGA**

Quarter VGA size, typically refers to a portrait oriented screen 240 pixels wide x 320 pixels high.

**RAS**

Remote Access Service.

**RMF**

Rich Music Format™ A file format developed by Beatnik combining the compact size of MIDI files with the high quality of MP3 and WAV.

**Rx**

Receive.

**SC**

Service Centre (for SMS).

**SDK**

Software Development Kit.

**SIM card**

Subscriber Identity Module card – a card that must be inserted in any GSM-based mobile terminal. It contains subscriber details, security information and memory for a personal directory of numbers. The card can be a small plug-in type or credit card-sized, but both types have the same functions. W960 uses the small plug-in card.

**SIM-AT**

SIM Application Toolkit – a means of providing simple applications that are stored on the SIM card.

**SMIL**

Synchronized Multimedia Integration Language. Used by MMS to describe how media objects are to be played.

**SMS**

Short Message Service. Allows messages of up to 160 characters to be sent and received via the network operator's message centre to a mobile phone.

**SMSCB**

SMS Cell Broadcast.

**SMTP**

Simple Mail Transfer Protocol. Protocol used to send email from an email client via an SMTP server.

**SIR IrDA**

Standard IrDA, up to 115 kbps IrDA.

**SS**

Supplementary Service.

**SWIM**

A SWIM card is a SIM card containing a WIM.

**T9**

(Text on 9 Keys) A text input system from Tegic that adds intelligence to multi-tapping letters on a telephone keypad.

**TCP/IP**

Transmission Control Protocol/Internet Protocol.

**TLS**

Transport Layer Security. As used by Web browsers.

**Tx**

Transmit.

**TTY (Teletypewriter)**

A telecommunication device with a keyboard and a visual display that is used primarily by people who are deaf, hard of hearing, or have a speech disability.

**UI**

User Interface. Sometimes called 'Man-Machine Interface'.

**UIQ**

A customizable pen-based user interface for media-rich mobile phones that is based on the Symbian OS. It may be used as the basis for building an attractive and efficient UI.

**URL**

Uniform Resource Locator. Points to a service or information on the Internet.

**USSD**

Unstructured Supplementary Services Data. Narrow-band GSM data service. An example is, entering \*79\*1234# might return the stock price for stock 1234.

**vCal; vCalendar**

vCalendar defines a transport and platform-independent format for exchanging calendar and scheduling information for use in PIMs/PDAs and group schedulers. vCalendar is specified by IETF.

**vCard**

vCard automates the exchange of personal information typically found on a traditional business card, for use in applications such as Internet mail, voicemail, Web browsers, telephony applications, call centres, PIMs /PDAs, pagers, fax, office equipment, and smart cards. vCard is specified by IETF.

**VGA**

Video Graphics Array. Graphics standard introduced by IBM, having a resolution of 640 x 480 pixels.

**VPN**

Virtual Private Network.

**WAP**

Wireless Application Protocol. Handheld devices, low bandwidth, binary coded, a deck/card metaphor to specify a service. A card is typically a unit of interaction with the user, that is, either presentation of information or request for information from the user. A collection of cards is called a deck, which usually constitutes a service.

**WAV**

Waveform audio. Format for storing sound.

**WBMP**

Wireless BitMap. Part of the WAP specifications, an image format optimized for small mobile devices.

**WBXML**

Wireless Binary Extensible Markup Language.

**WIM**

Wireless Identity Module.

**WMA**

Windows Media Audio, a compressed audio file format developed by Microsoft.

**WML**

Wireless Markup Language. A mark-up language used for authoring services, fulfilling the same purpose as HyperText Markup Language (HTML) does on the World Wide Web (www). In contrast to HTML, WML is designed to fit small handheld devices.

**WTLS**

Wireless Transport Layer Security. Part of WAP, WTLS provides privacy, data integrity and authentication on transport layer level between two applications.

## **XHTML™**

Extensible Hypertext Markup Language.

## **XML**

Extensible Markup Language.



# Related information

## Documents

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- W960 User guide
- W960 Web guide
- W960 FAQ
- AT Command Reference Manual
- WAP 2.0 Specifications

## Links

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- [www.sonyericsson.com](http://www.sonyericsson.com)
- [www.sonyericsson.com/fun/](http://www.sonyericsson.com/fun/)
- [www.sonyericsson.com/developer/](http://www.sonyericsson.com/developer/)
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- [www.imc.org/pdi/](http://www.imc.org/pdi/)
- [www.syncml.org](http://www.syncml.org)
- [www.w3.org/TR/SVGMobile/](http://www.w3.org/TR/SVGMobile/)
- [www.w3.org/TR/xhtml-basic/](http://www.w3.org/TR/xhtml-basic/)
- [www.java.sun.com](http://www.java.sun.com)

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